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### Address.

#### LEONARDO DA VINCI'S SCIENTIFIC RESEARCH, WITH PARTICULAR REFERENCE TO HIS INVESTIGATIONS OF THE VASCULAR SYSTEM.\*

By ARNOLD C. KLEBS, M.D., WASHINGTON, D. C.

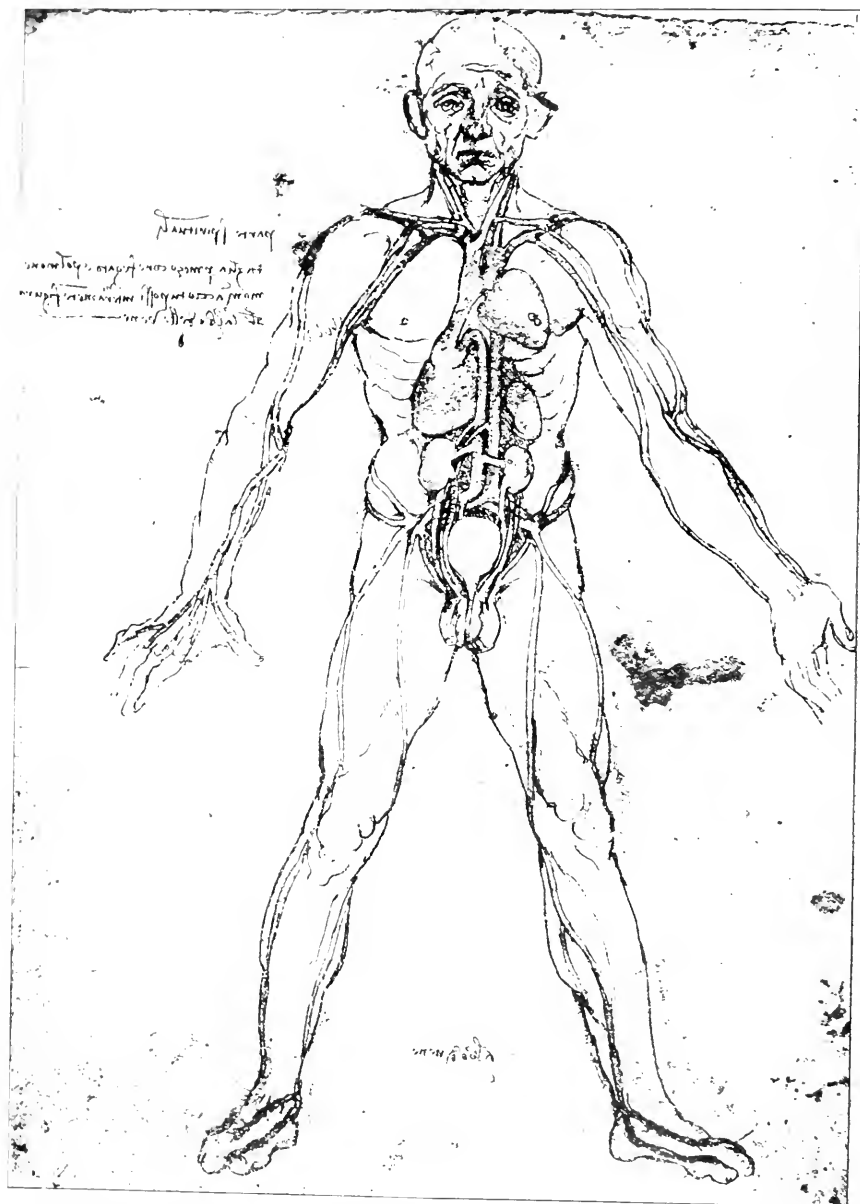
HISTORY in our days is not read any more as it used to be in less skeptical ages. Scientific scrutiny is applied to its component parts as far as material is available, and every effort is exerted toward bringing to light new material. The acceptance of historical events as gospel truth on account of the sanctity or intellectual authority of the recorder is relegated to the undiscussable realm of the emotional. And still we are very far from the day of an unemotional, objective representation of historical values. An innate obstacle, a mental inadequacy in ourselves, seems to exist, which again and again makes us revert to an uncritical worship of our old heroes, great discoverers, inspiring events, no matter how much cold reflexion, or contrary scientific evidence has done toward modifying the traditional picture. This evident inability to perceive and conceive the continuity of events has been well epitomized by Bergson by comparing the mental processes involved to the chemical and physical ones of the cinematograph. By means of this much perfected modern instrument we can increase the illusion of reality with

the number of single perceptions, photographic snap-shots in this case, which we project on the screen in rapid succession. Take, for example, the film of one event; a man saves a child from the water. In apparent continuity certain phases of the action impress us more distinctly than others; the child in the water, the man throwing off his coat, the splashing of the water, his reaching the child, for example. Between these main impressive phases we overlook the intermediate lesser phases. Their significance we realize only if we cut them out and obtain a ragged, improbable, unsatisfactory representation. And still this latter is exactly the method by which history is taught and the kind we read casually. Literary style and an appeal to the imagination have to make up for the deficiency.

*A priori* one should think that in the history of scientific research, those who have recorded the successive events would be less likely to succumb to purely literary temptations. Curiously enough this is not any more true here than in the realm of general history, although we can perceive in some modern endeavors a desire to draw away from unsupported tradition. But in general, the scientist also, when entering the historical field adheres to persons, episodes, discoveries, whose importance he almost inevitably exaggerates. Very often this tends to falsify our judgment, by elevating the epoch in which we live and work into a position of perfection out of the line of continuous evolution. It is worth while to practise from time to time a little introspection as regards the validity of our stock of traditions. While we are apt to look with scorn upon the dogmas, religions and others, which

\* Paper read before the Harvard Medical Historical Club, February 1, 1916.





"La figure de l'homme." This (schematic) drawing of the male torso has an interesting resemblance to the phlebotomy figures in Ketham's *Praxis Therapeutica* (Venae, 1491, and *Praxis*, 1501). (From Lascaud de Vinci: *Notes et Dessins*, Paris, 1901.)



This sketch, better perhaps than any other, shows Leonardo's mastery in anatomical observation, artistic and plastic perception, and technique of dissection. Very likely he injected the blood vessels in that way or some other hardening substance. (From Notes at Musée, Paris, 1901.)



eagerly snatched up by the defenders of the attacked idol. The battle is still on, although the one who stirred it up has been silent since its inception and the greatest defender of Vesalius' reputation (Roth) has been called to rest. It has reached the stage of trench warfare fought with the most perfected scientific weapons, and we neutrals are reaping the benefit in the form of a vastly increasing knowledge about both Vesalius and Leonardo.

It cannot be my intention, from what I have said before, to take part in the contest, or, as you may judge from the title of this paper, to pose as a protagonist of Leonardo's cause. I have tried to acquaint myself with all the available manuscripts, of which the most important collections are in Milan, Paris and London (now published practically in their totality in excellent facsimiles, with transcription and translations) and from the insight thus obtained, superficial as it may be, I have received certain general impressions.

Leonardo's lifetime—1452 to 1519—coincides with the auge of the Italian renaissance, that epoch during which what appears to us now as the senile mediæval intellect, had rejuvenated itself in the ardent contemplation of antique works and models. On the development of art Leonardo's influence in that epoch is admittedly paramount. Art critics are, perhaps, more easily satisfied than scientific ones, for also in art Leonardo's actual legacy is not abundant. The difficulty for the scientific critic is that he has to depend so much on the criterion of the written and published work. He cannot trace historically the influence of one man or school through long periods by a visual analysis of such subtle features as technique, mannerism, drawing, composition, or modelling in the work before him. And still the critic or historian of artistic and scientific work have this in common, that their respective objects of study, while differing in the mode of expression, aim both at the representation of the truth. But "there are two kinds of truth," as Froude says in his "Origen and Celsus"; there is the general truth, the truth of the idea, which forms the truth of poetry, there is the literal truth of fact, which is the truth of science and history. But when he adds: "They correspond to opposite tendencies in human nature, and never as yet have been found to thrive together"; while admitting the correctness of the inference in general, medicine, being both an art and science, escapes, in part at least, from the odium of such generalization. The artist with an eye trained by long practice and experience to observe the slightest deviations in outline, form and color, and a hand to render with utmost accuracy not only the object before the eye, but also the impressions retained by virtue of an often tested visual memory can, if his interests lie in this direction, render the greatest assistance in a scientific inquiry. Leonardo, who did possess these qualifications to a superlative degree, not only had the interest of

the "dilettante" or the humanistic scholar, striving for universal erudition after the fashion of his day, but a passion for knowledge. At least so he appears to us as we follow his train of thought in his notes. Ever and ever he seems urged on by irresistible curiosity to ask himself questions about anything and everything that comes into his path. His notes were not written, his sketches not drawn for publication. Whatever his own ultimate designs in this respect may have been, nothing so far has appeared from his hand which bears the mark of a manuscript intended for the press. All theories in this regard are without foundation.\*

This granted, and in the absence of any comprehensive and completed statement of his knowledge, how are we to apprehend and judge Leonardo's contribution to our science? Are we to consider him merely as an interesting phenomenon devoid of any or only negligible historic significance? Or may we perhaps, hope that further research may show his direct influence on the discoveries that grace the records of scientific history? If this history once is simply written, in Osler's sense, as the biography of the mind of men, one might be hopeful that Leonardo's work would find a place; meanwhile in the juxtaposition of individual biographies now called history of science, there is no definite place for Leonardo. And still in a sense this enhances his true value, not only because of his remarkable intellectual endowment or his artistic pre-eminence, which speak out of every page of his notebooks, but because, paradoxical as it may sound, for the fact that such methods as he employed in his search, such conclusions, which they allowed him to reach, could have, and evidently did, remain hidden for more than two hundred years. Had his notes and sketches just as they were, say in 1512, been put in order and published, that book would have a very definite place in the historical annals. Does the only fact that none has appeared diminish the greatness of the mind that produced the notes, and are we entirely forgetful of the fact that mind has always bespoken mind, even before the invention of the printing press, and presumably also after and without its intervention? Surely not. Thus we see incorporated in Leonardo merely that kind of intellectual force which has asserted itself in ways difficult, sometimes impossible, to trace; a force which exists in every thinker, whether in science or in other fields, and of all ages in varying degrees. From Leonardo's notes one is allowed to learn what he has to say almost as if one were hearing his own words, watching his objects with him and his delineation of their various aspects. He expresses himself not in the obscure latinity of scientific jargon, but in the vernacular, most fa-

\* In the collection of the Uffizi at Florence, Sudhoff discovered a drawing of a heart which he attributed to Leonardo. It is a loose leaf, which he holds by a thin red thread and outside appearance, may have formed the cover of a collection of anatomic sketches put together for presentation to the woodcutting. This single sheet, even if it can be proven to be by Leonardo, is evidently no conclusive evidence in the inquiry.



miliar to him, without any consciousness of having to address anybody, spontaneous, brief mental notes, when he cannot make his sketches speak, his preferred method. He does not argue and quarrel with scientific antagonists to show his own importance, but often he does introduce by the words, "the opponent says," possible objections to his own propositions. He does not tell us any harrowing tales of his going out in the dark night to cut the body of a criminal from the gibbet, nor does he seem to have hidden putrefying extremities in his bed chamber. His interest, however, in dissection and his skill in it are apparent to anyone who will study his sketches. Opportunity for dissection in his time was much more frequent than is usually assumed. In Milan, the chief centre of his anatomical work, at the Ospedale Maggiore and the Academia dei Fisici he could find all the material needed. He never complains of lacking material (save once when at Rome he was not allowed bodies for the purpose); the only thing he was always in need of was—time, which is easy to understand, considering the demands made upon him by the Ducal Court and his many other occupations.

But while his sketches are speaking witnesses for Leonardo's full understanding of the immeasurable advantage of direct observation and experiment over that derived by mere book study, it is evident that he also consulted the authorities the same as any intelligent searcher after truth must do. The paralyzing effect of book study and the worship of authority in those days is too often exaggerated. It existed then as it exists now, and it is sometimes worth while if we remember that we also swear by Darwin, Pasteur, Koch, Ehrlich as they did by Aristotle, Galen and Mondini, for instance. In all times there are those who by reading will come under the ban of authority, while to others thought, in whatever expression encountered, will beget thought. Leonardo's epoch is often represented as that of the dawn of sober thought after a night of distempered dreams. It is not so; his span of life and perhaps the few following decades mark the apogee of a cultural period, the roots of which reach into the twelfth and thirteenth Century; and after it a rapid decline took place. During that period there had been a good deal of literary activity, original to some extent, but consisting especially in translations of Greek and Arabic texts, which familiarized the student more and more with classical works in a purer form. When we reconstruct the library of Leonardo at the hands of the authorities which he occasionally mentions, we find that their works were available in his days in excellent printed editions. Aristotle he could consult in two good Latin editions (1479 and 1496) and the monumental Greek Aldine. The *editio princeps* of Galen was available to him in a superb volume from 1490 on. Out of it spoke to him not only the voice of that great encyclopaedist of medicine, but also the experimenter,

and not least of all the wisdom of the Alexandrian school, which linked Galen directly to Hippocrates. There is no doubt that Galen gave many a hint to Leonardo, but to a man with critical acumen the question of Galen's infallibility did not even occur. Galen's anatomy and physiology, based on direct research, in human as well as in animal bodies, by dissection and vivisection, could not be ignored by Leonardo, especially since it contained some of the thoughts of Galen's greater teachers, whose words were lost. Aristotle, Protagoras, Herophilus, Erasistratus thus came to Leonardo through Galen's intermediary, just as he probably reached Avicenna, and the other Arabic interpreters of Greek thought through Mondini's little manual. Of contemporaneous literature he mentions only the anatomy of Alessandro Benedetti, as a memorandum, it may be presumed, to acquire the book, for a perusal of it would have taught him precisely little. One work, however, not contemporary, but already a good deal more than a hundred years old, was available to Leonardo in several printed editions, Guy de Chauliac's "*Chirurgia*"; its first book on Anatomy might have struck a very sympathetic note. He might have read there the following significant sentence\*: "*Anatomical investigation has to proceed in two ways, by book study and by direct observation; the former is surely useful but not as sufficient as the latter to explain clearly what can be apprehended only through the senses,*" and when further along Guy also speaks of the value of anatomical illustrations, a method which he says, already his master, Henri de Mondeville, had successfully employed in teaching. Leonardo would certainly have approved.<sup>†</sup>

But we will now examine Leonardo's method of investigation as it appears in his notebooks. As we turn the folio leaves and study carefully his sketches and the notes in mirror writing (they with a little practice become fairly easily legible) we will at once recognize certain general features which will dissuade some school anatomists from proceeding any further unless they have acquired the habit of historical open-mindedness. If they have not, they will note with painful concern the entire absence of any systematic arrangement in Leonardo's anatomy, the few descriptive notes do not sufficiently enter into the totality of observable details, and they hopelessly mix up anatomic with physiologic considerations, employing a perfectly inadequate nomenclature. The organs dissected, drawn and described are not always from human subjects, so that human and animal anatomy might again become confused, as through

\* "*Anatomia inquiritur dupliciter, una modo per librum, et trinus, quia modis licet sit utilis, non est tam utilis ad charitandum ea quae solum sensibus cognoscuntur.*"

† Leonardo mentions once the name "Gondino," which may not refer to Guy de Chauliac. The anatomy of Alessandro Benedetti is noted on one of the rare dated sheets (the date is 1508), in which year two editions of the work were published; available, other authors mentioned are Hippocrates, Galen, and Cibalino.



Gaden. There is truth in these objections, but their validity fails when we remember that we have only notes before us, made as circumstances and available material permitted observation, sort of laboratory memoranda during years of study, later mixed up during the vicissitudes which befell them after they left Leonardo's keeping. We have to put them again into their logical order, for they naturally mark stages of growing enlightenment. Without entering here into his method of delineation, it must be said that he draws simply and clearly the objects before him without any embellishments. On his pages we encounter no "rod-looking muscle-man, who with detached pendulous muscles, leans against the ruins of an ancient temple; no charming nude lady reclining upon soft pillows of a gorgeous lounge, contemplating wistfully her own navel in the opened abdomen, pictures as we see them in a hundred anatomical works from Vesalins "Fabrica" into the Nineteenth Century, pictures which certainly do not contain art to please nor anatomy to teach.

Among the great number of sheets it may be interesting to select only a few of those dealing with internal organs, which surely do not concern themselves with what may be considered artistic anatomy. And it is particularly in these studies of internal organs where Leonardo's method excelled and was so very far in advance of similar attempts so far as we know them. I will endeavor to give an idea of his study of the heart, which occupies a great number of his sheets, although it is almost impossible to do justice to it, both as to his ingenious procedure and the penetration of his mind without constant reference to all of his many sketches. For here, more than in any other field, is it necessary to see plastically, in the three dimensions, so as to understand both structure and function. Leonardo, realizing the difficulty of verbal description says: "Oh, writer, how can you adequately describe in words the entire configuration, as is done in this drawing! Your description is confused, lacking in knowledge, and you can convey but little knowledge of the true forms to the listener; and you are mistaken when you think that you can satisfy him by talking on any solid object which is surrounded by planes. Remember not to get involved in verbal explanations unless you address the blind. . . . With what words will you describe this heart, without writing a book and without confusing the mind of the hearer by the very minuteness and thoroughness of your description! You will always need another commentator or return to experience which, again being very short for anyone, can impart only a relatively restricted notion of the whole of which you desire integral knowledge."\*

The pictorial representation Leonardo gives of the heart follows two directions. In the one he draws evidently from the objects before him,

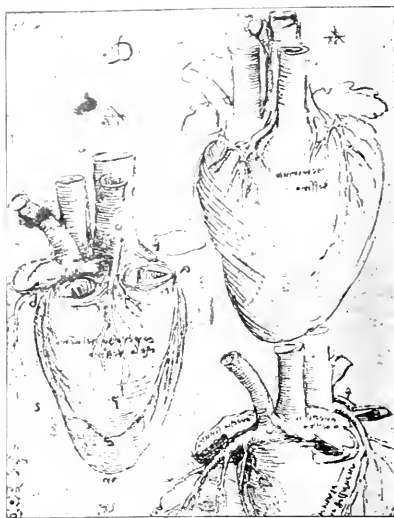


FIG. 1.—The inscription on the left sketch reads: "Vessels surrounding limits of right ventricle." This relationship is very similarly demonstrated in one picture in Heide. (from Quad. II, fol. 4r.)

in the other he schematizes. The drawings from the dissected objects—mostly bovine hearts—show his penetrating observation and also his skill in dissection. Anyone who has had experience in drawing from anatomical objects knows

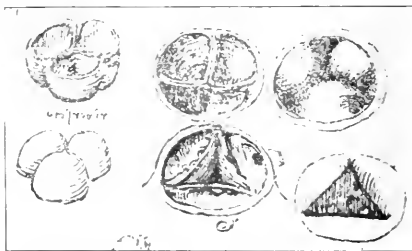


FIG. 2.—Testing various shapes of valve in left ventricle when it closes up. The "X" in circle at left probably represents a wax cast of the valve. (from Quad. II, fol. 9v.)

how difficult it is to prepare the organ and place it so that the special points one wishes to emphasize and their correlations are properly brought out in the delineation. It is, I believe,

\*"Ma, e quanto più l'istituto si avvilisce alla miseria, tanto più chondoleando la mente umana, e più si è scorse aver bisogno di confronti e di ritornare a un'esperienza, e a tale in via brevissima e di notizia di poche cose resta il tutto del soggetto di che s'andri integralmente."

\*This is not a perfect translation, which suffers somewhat from the fact that in the Quad. II, p. 2 of which the original is given, the text is a little disordered, and the original is not a perfect translation.



no exaggeration to assert that, up to Henle, attempts in this direction were rather primitive. This is of interest here because in some of Leonardo's drawings we find him employing methods of representation very similar to those of Henle for the purpose of demonstrating complex relations, the coronary vessels on the heart surface, for instance, to name only one example. Also, his schematic drawings do not merit the scorn which some strictly descriptive anatomists have heaped upon them. The schema as a stepping-stone between the true image and a concept has certainly done much mischief in the historical evolution of thought, but only when considered and used by itself without verification. As a help to a clear understanding of complex objects, and especially when their component parts vary in themselves or in relation to others, as implied in the functions of organs, for instance, comprehension without a schematic representation is almost impossible. For an evolution of Leonardo's actual knowledge his schematic drawings are more important than his strictly objective delineations or his notes. That Leonardo constantly endeavors to verify and correct his schematic drawings is evident from their frequent variation. In order to enable him to do this he employs several ingenious devices aside from careful and intelligent dissection. So it appears from some of his drawings that he employed some method for hardening the heart *in toto* (Holl). For a demonstration of the relative position of different parts such a method has obvious advantage, but in Leonardo it astonishes as an anticipation of most modern technique; the same in his use of horizontal and longitudinal cross-sections at different levels of the heart to show the relative position of the ventricles. He also employs currently injections of wax or plaster to inform himself better of the configuration and the size of cavities. So he obtains casts of the heart ventricles and most instructive plastic pictures of the semilunar valves, and it is very probable that he also used wax for injecting the coronary and other blood vessels. Characteristic of his desire for exactness is the use he makes, wherever possible, of mathematics, a desideratum of scientific research to which he gives frequent expression: "There is no certainty where one cannot apply one of the mathematical sciences."\*

\* "Nessuna certezza e dove non si applicare una delle scienze matematiche che overche non sono unite con esse matematiche." This sentence from the Paris Ms. G. (fol. 96 verso, Ravaisson-Mollien) exhibits a feature frequent in Leonardo's notes and one which produces sometimes the effect of obscurity. It is the repetition in different words of the same or similar sense within one sentence. Sometimes it appears as a sort of practice in expression, an intention quite obvious on many other pages, and in his lists of words and synonyms; sometimes he seems to amplify the sense, as for instance in the phrase: "Al where he an muscles in principale di forza e de potentissimo sopra li altri muscoli." (MS. G., fol. 1, verso) a translation of which is attempted in the following paragraph.

(To be continued.)

## Original Articles.

### THE MENACE OF SYPHILIS OF TODAY TO THE FAMILY OF TOMORROW.

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[From the Records of the Skin Department of the Boston Dispensary.]

EVERY new case of syphilis confronts the community with three distinct problems menacing to its health and well-being. There is the menace of the source of the present infection,—in most instances uncontrolled,—the danger from which is shown by the presence of the new case. The case at hand becomes a menace in turn to the clean-living public in proportion to the extent of contact, the infectiousness of the lesions and the inadequacy of the treatment received. The third menace is the great probability of passing the disease to the present or future marital partner, and in time of blighting the coming generation.

Immoral sexual intercourse is the common source from which all cases of syphilis start. An absolute control at this point would mean the ultimate automatic control of the tragic by-products of the disease,—extra-genital, marital, and congenital syphilis. Prostitution in Boston is largely a matter of the individual. Organized vice in the form of tolerated, sharply bounded districts and protected houses does not exist. As a result, the majority of victims may as successfully look for the proverbial "needle in the haystack," as to find again their particular partner to the infection, who is still fitting without restraint through the countless accessories to vice in this city and its suburbs. Thus, under the present vice conditions in Boston, even the most elementary follow-up work to control foci of infections among the immoral can be done only under the most taxing handicaps.

The menace of the syphilitic to the clean living public is a very real one. In a previous article by the author<sup>1</sup> this particular phase of the problem in Boston has been dealt with in detail. The occupational and family life brings the syphilitic with active lesions in daily contact with many innocent people. That this peril is not one of theory alone is shown by the fact that the cities of New York, Toronto, and Boston are making examinations for contagious and infectious diseases among the restaurant workers. The syphilitic patients at our clinic make little effort to follow up even the most elementary treatment. Twenty-eight per cent. of our patients for one year never returned. The criticism that this condition is exaggerated or purely local is not sustained. In a statistical efficiency report of conditions in New York City, Barringer and



Platt<sup>2</sup> report that 29% of 116 patients in a city clinic came but once.

The history of preventive medicine can present to-day no greater tragedy of disease than the home invaded by syphilis. Infection from immoral relations is the result of a danger to which the individual exposes himself with open eyes. Extra-genital infection acquired in the way of ordinary living forms but a tiny percentage of the total number of cases. But hosts of innocent syphilitides of the home are compelled to bear the penalty for the wrong-doings of others in years of ill-health and by death.

A study of detailed cases of family syphilis brings a keener realization of the price that the community pays for the presence of syphilis in the home than any consideration of mass statistics. For this purpose thirty families were tabulated according to their medical and social histories as they appeared for treatment at the Skin Department of the Boston Dispensary. Members of this group are designated "syphilitic" or "healthy" only when the present condition has been unmistakably established. The other classifications are made, according to the best judgment of the writer, after careful consideration of the facts at hand. The cases in detail are as follows:

#### FAMILY 1.

*Husband.* Refused to come to the clinic for examination. Has always been healthy as far as his wife knows. (Probably syphilitic.)

*Wife.* Married three years and knew husband seven years previous to that. Showed late secondary syphilitic and complained of headaches. (Syphilitic.)

##### *Pregnancies.*

1. Miscarriage at 7 months. (Probably syphilitic.)
2. Miscarriage at 2 months. (Probably syphilitic.)
3. Miscarriage at 2 months. (Probably syphilitic.)

#### FAMILY 2.

*Husband.* Was given three injections of salvarsan at the Boston City Hospital three years ago but has not continued treatment for the past two years as he feels and considers himself well. (Syphilitic.)

*Wife.* Showed a late secondary syphilitic and complained of general pains. (Syphilitic.)

##### *Pregnancies.*

1. Boy, 7 years old, living and well. (Healthy.)
2. Girl, full-term, lived 40 minutes. (Probably syphilitic.)
3. Still-born. (Probably syphilitic.)

#### FAMILY 3.

*Husband.* Married at 22. Developed secondary syphilis a few months after marriage. Drank hard. Became feeble-minded and died at the Taunton Insane Hospital. (Syphilitic.)

*Wife.* Married at 18. Left husband ten times because of drunkenness and abuse and returned on his promises to reform. Came to the clinic with mucous patches, hoarseness and headaches. (Syphilitic.)

##### *Pregnancies.*

1. Miscarriage at 6 months. (Probably syphilitic.)
2. Induced miscarriage at 3 months.
3. Boy, died in 2 days. (Probably syphilitic.)
4. Miscarriage at 2 months. (Probably syphilitic.)

#### FAMILY 4.

*Husband.* Denied all venereal disease by history and by symptoms. Has a syphilitic aortitis of many years' duration. Is treating at the Peter Bent Brigham Hospital. Wassermann strongly positive. (Syphilitic.)

*Wife.* Married at 20. Denies all sexual relations previous to marriage. General health good except for chronic diarrhea of many years' duration. Wassermann strongly positive. (Syphilitic.)

##### *Pregnancies.*

1. Miscarriage at 8 months. (Probably syphilitic.)
2. Miscarriage at 5 months. (Probably syphilitic.)
3. Miscarriage at 2 months. (Probably syphilitic.)
4. Boy, 16 years old, living and well. Wassermann strongly positive. (Syphilitic.)
5. Miscarriage at 4 months. (Probably syphilitic.)
6. Miscarriage at 4 months. (Probably syphilitic.)
7. Girl, 12 years old. Has had "heart trouble" for years. Wassermann strongly positive. (Syphilitic.)

#### FAMILY 5.

*Husband.* Contracted syphilis two years before marriage. Did not have any comprehension of the seriousness of the disease and took treatment for only a little while. Feels perfectly well now and declines to take treatment under any circumstances. (Syphilitic.)

*Wife.* Married at 15 to her first husband, by whom she had five healthy children. Married second husband five years ago. Has had no symptoms of the disease. Wassermann strongly positive. (Syphilitic.)

##### *Pregnancies.*

6. Boy, 3 years old, congenital syphilitic. (Syphilitic.)
7. Girl. Died in 10 days. The child is said to have peeled and turned black. (Probably syphilitic.)

#### FAMILY 6.

*Husband.* Cured a "woman sickness" during his honeymoon. Is at present a soldier in the Italian army. (Probably syphilitic.)

*Wife.* Complained of general malaise and vague pains. Wassermann positive. (Syphilitic.)

##### *Pregnancies.*

- 1-7. Miscarriages. (Probably syphilitic.)
8. Girl, a congenital syphilitic, that died in two days. (Syphilitic.)

#### FAMILY 7.

*Husband.* Not under any treatment and nothing definite known about his condition. (Probably syphilitic.)

*Wife.* Has suffered with interstitial keratitis and severe headaches. (Syphilitic.)



*Pregnancies.*

1. Miscarriage at 7 months. (Probably syphilitic.)
2. Miscarriage at 7 months. (Probably syphilitic.)
3. Miscarriage at 7 months. (Probably syphilitic.)
4. Boy, 5 months old, congenital syphilitic. (Syphilitic.)

## FAMILY 8.

*Husband.* (First.) Nothing known about his health or his present whereabouts. (Probably syphilitic.)

*Husband.* (Second.) Old syphilitic case, now starting locomotor ataxia. Wassermann strongly positive. (Syphilitic.)

*Wife.* Married first husband at 17. Divorced him three years later for unfaithfulness. Married second husband at 25. No pregnancies by second husband. Wassermann strongly positive. (Syphilitic.)

*Pregnancies.*

1. Miscarriage at 3 months. (Probably syphilitic.)

## FAMILY 9.

*Husband.* Was always sickly, had a cough, lost his voice, and finally died of what was supposed to be tuberculosis. (Probably syphilitic.)

*Wife.* Has always been well except for gummata of the legs. (Syphilitic.)

*Pregnancies.*

1. Miscarriage at 8 months. (Probably syphilitic.)
2. Miscarriage at 6 months. (Probably syphilitic.)
3. Miscarriage at 6 months. (Probably syphilitic.)

## FAMILY 10.

*Husband.* Had intercourse with many women during his early married life. Took spasmodic treatment for syphilis from various doctors. Died suddenly of "heart trouble" two years ago. (Syphilitic.)

*Wife.* Has had poor health and pains in the legs and the chest for years. Wassermann strongly positive. (Syphilitic.)

*Pregnancies.*

1. Still-born. (Unclassed.)
2. Boy, 14 years old, living and well. Wassermann negative. (Unclassed.)
3. Boy, 12 years old, that has "fits." Wassermann strongly positive. (Syphilitic.)
4. Boy, 10 years old, that has always been sickly. Wassermann strongly positive. (Syphilitic.)

## FAMILY 11.

*Husband.* Denies all venereal disease and feels perfectly well. Wassermann moderately positive. (Syphilitic.)

*Wife.* Complaints of headache, indigestion and vague symptoms. Health had always been excellent up to the beginning of the first pregnancy. Is now two months pregnant. Wassermann strongly positive. (Syphilitic.)

*Pregnancies.*

1. Boy, 16 months old, strong and healthy in every way. Wassermann moderately positive. (Syphilitic.)

## FAMILY 12.

*Husband.* Began to have immoral relations with women shortly after marriage. Hard drinker and has been committed to state institutions four times. Is not living with wife at present. (Probably syphilitic.)

*Wife.* Married at 18. General health has always been good. Wassermann moderately positive. (Syphilitic.)

*Pregnancies.*

1. Girl, died at four months of unknown trouble. (Unclassed.)
2. Miscarriage at 4 months. (Probably syphilitic.)
3. Miscarriage at 6 months. (Probably syphilitic.)
4. Miscarriage at 4 months. (Probably syphilitic.)
5. Boy, 10 years old, that has a syphilitic hip trouble. (Syphilitic.)
6. Girl, 7 years old, living and well. (Unclassed.)
7. Girl, 4 years old, living and well. (Unclassed.)

## FAMILY 13.

*Husband.* Denies all venereal disease and health has always been excellent. Wassermann strongly positive. (Syphilitic.)

*Wife.* Married at 15 in Syria. Health has always been good. Wassermann moderately positive. (Syphilitic.)

*Pregnancies.*

1. Girl, 24 years old, living and well. (Unclassed.)
2. Miscarriage at 4 months. (Unclassed.)
3. Girl, 20 years old, living and well. Wassermann negative. (Unclassed.)
4. Boy, 18 years old, that is very feeble-minded. (Probably syphilitic.)
5. Miscarriage at 3 months. (Probably syphilitic.)
6. Boy. Became "crippled" so that he was never able to walk, and died at 9 years of an unknown trouble. (Probably syphilitic.)
7. Miscarriage at 2 months. (Probably syphilitic.)
8. Girl. Became "crippled" at 4 months in the same way as did Child 6 and died at 5 years. (Probably syphilitic.)
9. Boy. Became "crippled" at 4 months as did the other children and died at 2 years of congenital syphilis in the Children's Ward of the Boston Dispensary. (Syphilitic.)

## FAMILY 14.

*Husband.* Contracted syphilis a short time before marriage. Has had irregular treatment for several years. (Syphilitic.)

*Wife.* Married at 17. Health has always been excellent. Wassermann moderately positive. (Syphilitic.)

*Pregnancies.*

1. Girl, 18 years old, that is a congenital syphilitic. (Syphilitic.)
2. Boy, 16 years old, living and well. (Unclassed.)
3. Boy, lived only 4 hours. (Probably syphilitic.)
- 4-10. Woman claimed to have caused 7 miscarriages in succession by introducing a catheter



dipped in vaseline into the uterus when she was about three months pregnant.

11. Girl, 4 years old, congenital syphilitic. (Syphilitic.)

#### FAMILY 15.

*Husband.* Contracted syphilis before marriage. Has been insane for 14 years and is at present confined in one of the State Hospitals for the Insane. (Syphilitic.)

*Wife.* Married at 20. Husband was "queer" at the time she married him. Has suffered from severe headaches for years. Wassermann strongly positive. (Syphilitic.)

#### Pregnancies.

1. Still-born. (Probably syphilitic.)
2. Miscarriage at 2 months. (Probably syphilitic.)
3. Miscarriage at 5 months. (Probably syphilitic.)
4. Boy, died at 8 months of "brain trouble." (Probably syphilitic.)

#### FAMILY 16.

*Husband.* Contracted syphilis about 9 years ago. Took treatment for only a few months. (Syphilitic.)

*Wife.* Healthy in every way according to the husband, who declines to have her come to the hospital for observation. (Probably syphilitic.)

#### Pregnancies.

1. Boy, 18 years old, living and well. (Healthy.)
2. Girl, 16 years old, living and well. (Healthy.)
3. Girl, 11 years old, living and well. (Healthy.)
4. Miscarriage at 4 months. (Probably syphilitic.)

#### FAMILY 17.

*Husband.* Wife states that he is a "cheap sport." Since marriage continues immoral relations with women, and in one instance was the father of an illegitimate child. (Probably syphilitic.)

*Wife.* Married at 19. Husband deserted her about a year ago. Has always been the sole means of support for the family. Is now working in a candy factory and is applying for a divorce. (Syphilitic.)

#### Pregnancies.

1. Miscarriage at 4 months. (Probably syphilitic.)
2. Miscarriage at 7 months. (Probably syphilitic.)
3. Miscarriage at 7 months. (Probably syphilitic.)

#### FAMILY 18.

*Husband.* Came to the clinic 6 years ago and was treated for two months only. No treatment since. (Syphilitic.)

*Wife.* Complains of headaches and has gummata on the legs. Has been taking occasional treatment for 5 years. (Syphilitic.)

#### Pregnancies.

1. Boy, 9 years old, living and well. (Healthy.)
2. Boy, 6 years old, that has been treated for congenital syphilis since birth. (Syphilitic.)

#### FAMILY 19.

*Husband.* Characterized by wife as a "cheap sport" and a hard drinker. Had immoral relations with other women beginning three weeks after marriage. Deserted wife 4 years ago. (Healthy.)

*Wife.* Married at 21. Knew husband only a few weeks before marriage. Two years following separation from her husband she met a musician, whose special attraction was a touring car. He has a wife and five children. Through him this woman contracted syphilis and became pregnant. With the help of the Children's Aid Society the case was settled for \$500 and a monthly payment of \$10 to the grandmother for taking care of the child. Woman came to the clinic with a late rash and lesions on the palms. Wassermann strongly positive. (Syphilitic.)

#### Pregnancies.

1. Girl (by husband), 6 years old, living and well. (Healthy.)
2. Boy (by musician), 9 months old, with syphilitic periostitis and snuffles. (Syphilitic.)

#### FAMILY 20.

*Husband.* Nothing definite known about his habits. Died of pneumonia 4 months after marriage. (Syphilitic.)

*Wife.* Pretty but mentally defective girl. Married in January, 1913, at 18. Developed syphilis and became pregnant in February. Husband died in April. Congenital syphilitic child born in November. Since that time the baby has received institutional care in various places and the mother has worked as a waitress in many restaurants, including eight months at a Wellesley College dining hall. In spite of 8 salvarsans and much mercury at another hospital, the girl appeared in the clinic for the first time with mucous patches, split papules, and very extensive condylomata. The menace that she was to others was particularly impressed upon her at that visit. One week later the patient returned and stated in an embarrassed way that the night following her visit to the clinic she had yielded to the persuasion of a persistent suitor and was married to him by a justice of the peace. Learning of his wife's condition the bridegroom left his wife 10 days after marriage and is now suing for divorce. It is not known whether he became infected. The girl is now working as a waitress, and, according to her own story, is leading the life of a common prostitute. She is also pregnant by a party unknown to her. (Syphilitic.)

#### Pregnancies.

1. Boy, 19 months old, congenital syphilitic. (Syphilitic.)

#### FAMILY 21.

*Husband.* Has always been in good health and refused to be examined. (Probably syphilitic.)

*Wife.* Has been in poor health for years. Wassermann strongly positive. (Syphilitic.)

#### Pregnancies.

1. Boy, 9 years old, living and well. (Healthy.)
2. Girl, died at 4 years of diphtheria.
3. Still-born. (Probably syphilitic.)
4. Still-born. (Probably syphilitic.)
5. Still-born. (Probably syphilitic.)
6. Still-born. (Probably syphilitic.)

#### FAMILY 22.

*Husband.* Runaway marriage at the age of 21. Never lived with his wife and the marriage was never known. (Healthy.)

*Wife.* Married at 16. General health has always been excellent. Came to the clinic with a late syphilitic eruption. Has had one "friend" for the



past 14 years by whom she has been pregnant twice. (Syphilitic.)

*Pregnancies.*

1. Miscarriage at 5 months. (Probably syphilitic.)
2. Miscarriage at 3 months. (Probably syphilitic.)

FAMILY 23.

*Husband.* Denies all venereal disease. Trouble started one year ago with girdle pains and dizziness when walking. Now has a well advanced case of locomotor ataxia. Wassermann strongly positive. (Syphilitic.)

*Wife.* Denies all exposure other than husband. Has always been in good health. Wassermann strongly positive. (Syphilitic.)

*Pregnancies.*

1. Girl, 3 years old, living and well. (Probably syphilitic.)
- 2 and 3. Twin boy and girl, 6 months old, living and well. (Probably syphilitic.)

FAMILY 24.

*Husband.* Is a member of a fire department. Has always been a periodic hard drinker and has had constant immoral relations with women since marriage as well as before. Contracted syphilis from a prostitute while on a drunk two years ago. His wife was pregnant with the third child at the time. (Syphilitic.)

*Wife.* Contracted syphilis from her husband shortly after his exposure. (Syphilitic.)

*Pregnancies.*

1. Boy, 6 years old, living and well. (Healthy.)
2. Girl, 4 years old, living and well. (Healthy.)
3. Girl, 6 months old, congenital syphilitic. (Syphilitic.)

FAMILY 25.

*Husband.* Previous history and present condition unknown. (Probably syphilitic.)

*Wife.* Contracted syphilis from a friend three years previous to her marriage. Treated with a private doctor for two years and was pronounced cured. Married in August, 1914. Wassermann moderately positive. (Syphilitic.)

*Pregnancies.*

1. Boy, died in 2 months of congenital syphilis. (Syphilitic.)

FAMILY 26.

*Husband.* Has had two attacks of gonorrhea and contracted syphilis two years before marriage. Received a month's treatment for syphilis from a private doctor. Has had immoral relations with four or five girls since marriage. (Syphilitic.)

*Wife.* Felt perfectly well and could not be induced to come to the clinic for examination. Husband states that she has occasional immoral relations with "friends." (Probably syphilitic.)

*Pregnancies.*

1. Miscarriage at 7 months. (Probably syphilitic.)

FAMILY 27.

*Husband.* Contracted syphilis in 1910. Has taken no treatment and leads a generally dissipated life. (Syphilitic.)

*Wife.* Married at 19 and is now 38 years old. Has been pregnant 15 times, 12 times before her husband's infection and 3 times since. Of the first 12 children 5 are living and well and 7 died of chil-

dren's diseases. This woman has had very fair health for the past twenty years. The syphilitic children have been under institutional care since birth. At the time of writing she is 5 months along in her 16th pregnancy. Wassermann moderately positive. (Syphilitic.)

*Pregnancies.*

13. Boy, 3 years old, congenital syphilitic. (Syphilitic.)
14. Girl, 2 years old, congenital syphilitic. (Syphilitic.)
15. Girl, 1 year old, congenital syphilitic. (Syphilitic.)

FAMILY 28.

*Husband.* Previous history and present condition unknown. Is too busy with his daily work to come to the clinic. (Probably syphilitic.)

*Wife.* General health has been good. First two children were born in Russia. Wassermann weakly positive. (Syphilitic.)

*Pregnancies.*

1. Girl, 16 years old, living and well. (Healthy.)
2. Boy, died at 10 months of smallpox.
3. Miscarriage at 3 months. (Probably syphilitic.)
4. Miscarriage at 3 months. (Probably syphilitic.)
5. Girl, died at 5 years of appendicitis. (Probably syphilitic.)
6. Girl, 5 years old, congenital syphilitic. (Syphilitic.)

FAMILY 29.

*Husband.* General health poor. Contracted syphilis shortly before marriage and is taking treatment from private doctors. (Syphilitic.)

*Wife.* Had three healthy children by her first husband. Contracted syphilis from her second husband 25 years ago. General health good. On coming to the clinic she showed an active palmar syphilitic. (Syphilitic.)

*Pregnancies.*

4. Still-born. (Probably syphilitic.)
5. Still-born. (Probably syphilitic.)
6. Boy, 21 years old. Lost sight of one eye at 4 weeks and the sight of the other at 7 years for unknown reasons. Is not normal mentally. (Probably syphilitic.)

FAMILY 30.

*Husband.* Contracted syphilis from a married friend during his wife's pregnancy. Wassermann strongly positive. (Syphilitic.)

*Wife.* Came to the clinic with active secondary lesions. Wassermann strongly positive. (Syphilitic.)

*Pregnancies.*

1. Boy, 3 months old, congenital syphilitic. (Syphilitic.)

A statistical summary of the ravages of syphilis in these thirty families is as follows:

HUSBANDS.	
Syphilitic .....	19
Probably syphilitic .....	10
Healthy .....	3
Total .....	32
Under treatment at clinic .....	10
Under treatment elsewhere .....	3
No treatment .....	12



Dead (syphilitic).....	4
Healthy.....	3
Total.....	32

## WIVES.

Syphilitic.....	28
Probably syphilitic.....	2
Healthy.....	0

Total.....30

Under treatment at clinic.....	28
Under treatment elsewhere.....	0
No treatment.....	2
Dead.....	0

Total.....30

## PREGNANCIES.

## LIVING.

Syphilitic.....	19
Probably syphilitic.....	5
Healthy.....	23
Unclassed.....	6

Total.....53

## DEAD.

Miscarriages.	
Still-births.	
(Syphilitic).....	53
Miscarriages.	
(Other causes).....	8
Intercurrent diseases with syphilis.....	6
Other diseases.....	9
Unclassed.....	3

Total.....79

Total pregnancies.....132

**Husbands.** Less than 10% escaped the infection. Four died with syphilis a contributing factor. Two suffered with insanity. Twelve out of a possible twenty-five are not taking any treatment.

**Wives.** Twenty-eight out of thirty of the women were infected, and the remaining two probably had the disease. The women were usually the first members of the family groups to come to the clinic and number under treatment is relatively large when compared with the number of the men.

**Pregnancies.** There were 132 definite pregnancies in these thirty families. These resulted in only 23 healthy children, the large majority of whom were born before infection entered the family. Of the 53 living children syphilis claims at least 24 or 45%. In the cases of the 79 deaths syphilis may be credited as the probable causative factor in at least 59 or 74%. Totaling, syphilis scores in 83 out of 132 pregnancies, or 62%.

The early syphilis of to-day can well be depended upon to furnish the family syphilis of tomorrow. Syphilis is usually acquired by the unmarried of both sexes in early adult life. Lulled to a false security by the lack of symptoms after a short course of treatment the patients marry. The marital partners may appear

in the clinic with the early symptoms of syphilis and the originators reappear with the late lesions. The truth of this generality is shown by a tabulation of the type, age, and marital status at the time of entrance of 500 consecutive cases of adult syphilis in this clinic.

## SINGLE MEN.

Age.	—20	21-25	26-30	31-40	41+	T.	T. %
Early	24	67	24	10	7	132	.264
Secondary	11	20	24	19	6	80	.160
Late	0	0	2	15	7	24	.048
Total	35	87	50	44	20	236	
Total %	.070	.174	.100	.088	.040	.472	.472

## SINGLE WOMEN.

Age.	—20	21-25	26-30	31-40	41+	T.	T. %
Early	8	2	0	0	0	10	.020
Secondary	9	10	4	1	0	24	.048
Late	0	0	0	1	0	1	.002
Total	17	12	4	2	0	35	
Total %	.034	.024	.008	.004	.000	.070	.070

## MARRIED MEN.

Age.	—20	21-25	26-30	31-40	41+	T.	T. %
Early	0	10	7	5	6	28	.056
Secondary	0	3	10	9	6	28	.056
Late	0	1	7	8	26	42	.084
Total	0	14	24	22	38	98	
Total %	.000	.028	.048	.044	.076	.196	.196

## MARRIED WOMEN.

Age.	—20	21-25	26-30	31-40	41+	T.	T. %
Early	3	3	0	6	2	14	.028
Secondary	8	18	12	22	7	67	.134
Late	0	1	2	21	26	50	.100
Total	11	22	14	49	35	131	
Total %	.022	.044	.028	.098	.070	.262	.262

**Single Men.** (236 Cases.) The single men comprised over 47% of the entire number of cases. Two hundred and twelve had early or secondary syphilis, and 172 (72%) contracted the disease before their thirtieth year. Considering that a large proportion of these men will marry and that on an average 70% of them make less than five visits to the clinic, the tremendous danger to their future homes can be realized.

**Single Women.** (35 Cases.) Where does the clinic's quota of single women, proportionate to the number of single men, go for treatment? With few exceptions the 236 single men probably represent as many different women who have been active foci. Yet the group of single women coming to the clinic is nearly 85% less than the group of single men. Statements from many doctors are all in agreement that the number of single women among their private patients is proportionately small. The bringing under medical supervision of the relatively large number of single women, now apparently under no control, would go a long way toward removing



active foci of infection and minimizing the danger to their future husbands and children. As with the single men, syphilis was acquired at an early age, 29 out of 35 contracting it under 25 years of age.

**Married Men.** (98 Cases.) Among the married the tide turns toward the later stages of the disease. Sixty out of 98 cases came to the clinic after their thirtieth year and nearly half the cases presented late symptoms.

**Married Women.** (131 Cases.) In contrast to the single women, the number of married women is considerably larger than the number of married men. It is in this group of "women of the home" that the members missing from the group of "women of the street" appear with the later lesions of the disease. Only 14 of the 131 married women came to the clinic with lesions of less than three months' duration. Fifty or 38% of the number had late or gummatous lesions.

#### SUMMARY.

1. The menace of syphilis in the home is one of the greatest problems of preventive medicine.
2. In thirty families, 59 out of 62 parents were probably infected.
3. Of 132 possible children, only 23, most of whom were born before their parents' infection, were healthy.
4. Of the remaining 109, syphilis claims through miscarriage, later death, or congenital disease at least 83 pregnancies.
5. Syphilis will appear in the home of tomorrow in proportion to the inadequacy of treatment among the "men and women of the street" of today.

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## VAGINAL HYSTERECTOMY FOR PROLAPDENTIA, WITH A REPORT OF FIFTY CASES.\*

By P. E. TRUESDALE, M.D., FALL RIVER, MASS.

THE surgical problem which deals with complete prolapse of the uterus is in principle similar to that applied to the cure of hernia elsewhere. The operation involves the excision of a large pendulous sac with the reduction and retention or removal of its contained organs. The over-stretched bladder and rectum are detached from the sac and allowed to contract. The bladder must be elevated and supported upon a shelf erected by an appropriate use of the pelvic ligaments. The importance of creating a deflecting plane as an effective resistance to intra-abdominal pressure is paramount. Goffe<sup>1</sup> quotes Sturmdorf in his own elaboration of this principle.

\* Read before the New Hampshire Surgical Club, April 11, 1916.

Vaginal hysterectomy is one of the very useful operations employed in the execution of these measures. Its application is limited to a class of cases in which conservation of the uterus may be disregarded. The wisdom of its choice, however, in most cases, has been a subject of controversy. Many of the continental authors favor the Wertheim-Shauta operation which preserves the uterus, while in America a fair division of opinion is maintained toward the Watkins-Wertheim anterior transposition operation, vaginal hysterectomy, and some form of suspension or fixation of the uterus. Goffe,<sup>2</sup> and C. H. Mayo,<sup>3</sup> among others, advocate vaginal hysterectomy in a group of patients past forty years of age, manifesting prolapse of the complete type.

In general, the details of technic will vary to meet the requirements in each case. The uterus may be found in a state of sub-involution or atrophy, but the one constant and often startling revelation is the unusual length of the cervix, often exceeding that of the body by several centimeters.

The weak point may be in front of the uterus in the region of the bladder or it may be the uterosacral ligaments and perineum, allowing the descent of the uterus and rectum. In patients over fifty years of age the tissues are often found

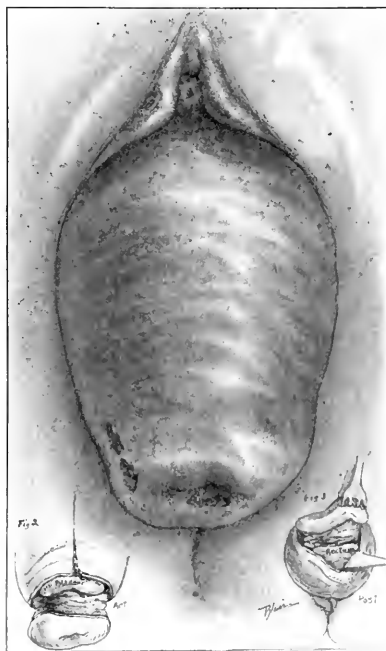


PLATE I.—Prolapsed of the complete type. Reproduced from Case 44. Figs. 2 and 3 show the first incision overlying the cervix. The bladder is exposed anteriorly and the rectum posteriorly.



Case Same Age Number of Delivery Director of Hospital Date of Discharge

Case	Same	Age	Number of Delivery	Director of Hospital	Date of Discharge	Present condition
1	B.C.	65	7	Normal. Mildly with men-	Complete	Examined
2	M.B.	54	9	7 instru- mental	Complete	Examined
3	M.S.	60	11	4 instru- mental	Complete	Examined
4	S.L.	43	5	2 instru- mental	Complete	Examined
5	E.A.B.	73	5	Normal. Mildly with men-	Complete	Examined
6	R.C.	50	1	Normal	Complete	Examined
7	S.B.	59	2	Normal	Complete	Examined
8	M.B.	41	9	2 instru- mental	Complete	Examined
9	L.D.	67	14	Normal	Complete	Examined
10	E.P.	51	6	1 instru- mental	Partial protrusion of cervix	Examined
11	E.P.	56	5	Normal. Mildly with men-	Complete	Examined
12	L.P.S.	49	5	Normal	Complete	Examined
13	C.C.	50	6	1 instru- mental	Complete	Examined
14	M.A.S.	49	3	1 instru- mental	Complete	Examined
15	R.B.	48	1	Instrumental	Complete	Examined
16	J.D.	34	5	5 instru- mental	Complete	Examined
17	E.L.	48	5	1 instru- mental	Complete	Examined
18	P.B.	35	1	Instrumental	Partial protrusion of cervix	Examined
19	M.N.K.	43	3	Normal	Complete	Examined
20	J.L.	45	5	Normal	Partial protrusion of cervix	Examined
21	E.M.P.	41	2	1 instru- mental	Complete	Examined
22	P.B.	76	1	Instrumental	Complete	Examined
23	J.L.	49	14	Normal	Partial protrusion of cervix	Examined
24	M.B.	45	12	1 instru- mental	Partial protrusion of cervix	Examined
25	M.A.R.	38	1	Instrumental	Complete	Examined

to have undergone degeneration, are friable, and thus allow the sutures to cut through. The obvious result is a weak, imperfect union of the broad ligament stumps, or no union at all. A solid pelvic floor is very essential to success but it will not support the vaginal walls without a reasonable support above. An occasional failure in my series of cases was undoubtedly due to a separation of the broad ligament line of union. To make better provision against such faulty union of the broad ligament stumps, I have modified the operation to include a strip of uterine muscle on either side, making an apposition of the broad ligaments with a strip of uterine muscle to form a central body of support. This method in many cases will serve to fortify a weak step in the operation as usually done. The procedure differs from the operation described by Watkins, inasmuch as the entire cavity and elongated cervix are removed. In other respects the technic does not differ essen-

tially from that commonly used and may be described as follows:

The cervix is first grasped with a volsellum forceps. While held in position an incision is made encircling the cervix immediately below the bladder line. By sponge dissection the bladder is separated from the elongated cervix up to the peritoneal fold, which is deflected from the uterine body to the bladder. This is opened while the bladder is supported upon the long flat blade of a retractor. The mucous membrane in the lateral and posterior sulcus of the vagina is also separated by sponge dissection. The uterine artery on either side is tied and cut. The fundus uteri is then delivered through the peritoneal opening in front and the central portion of the uterine body with the entire cervix is removed after the manner illustrated in Plate III. Apposition by interrupted catgut suture is then made of the uterine muscle stumps of the broad ligaments. Upon the anterior surface of this central body is now sutured the dependent portion of the bladder, two or three catgut sutures being used for this purpose. The remaining distance of this central



26	B.F.	63	9	2 instru- mental	12 years	Complete	Jan. 1912	Examined	Good anatomical result. No pelvic symptoms.
27	M.A.L.	67	2	Instrumental	4 years	Complete	Jan. 1913	Examined	Anatomical result—partial success. Residual urine. Frequent.
28	A.M.D.	36	6	Normal	2 years	Complete	Feb. 1913	Reported	Well satisfied with result.
29	V.B.	39	1	Normal	10 years	Partial protrusion of cervix	March 1913	Examined	Good anatomical result. No pelvic symptoms.
30	M.H.	54	10	Midwife attendance	10 years	Complete	June 1913	Examined	Good anatomical result. Well.
31	E.N.	45	4	1 instru- mental	6 years	Complete	Oct. 1912	Reported	Not well.
32	M.K.H.	54	4	1 instru- mental	6 years	Partial protrusion of cervix	Nov. 1913	Examined	Good anatomical result. No pelvic symptoms.
33	E.M.P.	67	2	1 instru- mental	4 years	Complete	Jan. 1914	Examined	Anatomical result—partial success Urination, 8-9
34	M.E.F.	55	5	Midwife attendance	1 year	Complete	Feb. 1914	Examined	Good anatomical result. Symptomatically well.
35	J.P.	40	1	Normal	5 years	Complete	March 1914	Examined	Good anatomical result. No complications.
36	M.S.	40	10	2 instru- mental	4 years	Partial protrusion of cervix	April 1914	Examined	Good anatomical result Well
37	P.L.N.	69	4	1 instru- mental	5 years	Complete	Sept. 1914	Examined	Good anatomical result. No pelvic symptoms
38	F.R.	42	5	Normal	4 years	Complete	Dec. 1914	Examined	Anatomical result—partial success Constipation
39	B.C.L.	59	None		1 year	Complete	Dec. 1914	Examined	Good anatomical result. Well.
40	E.L.	54	10	Normal	5 years	Complete Protrusion of cervix	Jan. 1915	Examined	Good anatomical result. Well.
41	B.E.	60	11	Midwife attendance	15 years	Complete	Jan. 1915	Examined	Good anatomical result. Ecthema.
42	M.B.	54	4	Normal	5 years	Fibroid complete	Jan. 1915	Reported	Satisfactory result from operation.
43	A.E.	49	None		1 year	Complete	Jan. 1915	Examined	First operation—failure. Second operation necessary in 1916.
44	L.G.	62	10	2 instru- mental	5 years	Complete	May 1915	Reported	Good result from operation.
45	E.A.	66	4	1 instru- mental	20 years	Complete	April 1916	Reported	Good result from operation.
46	C.B.	54	5	Normal	1 year	Complete	July 1916	Examined	Good anatomical result. Well.
47	M.G.	40	10	Normal	3 years	Complete	Aug. 1916	Examined	Good anatomical result. Well.
48	E.G.	54	6	Normal	1 year	Complete	Aug. 1916	Examined	Good anatomical result. No pelvic symp
49	E.L.	69	None		10 years	Complete	Aug. 1916	Examined	Good anatomical result. Well.
50	L.S.	44	6	Normal	2 years	Complete	Aug. 1916	Examined	Good anatomical result. Well.

body is sutured by interrupted catgut ligatures to the anterior vaginal walls, or the central body of the uterine muscle, above described, may be turned forward under the bladder after the manner described by Watkins. No drainage is used; a perineorrhaphy completes the operation. A self-retaining catheter is then inserted and left in place for forty-eight hours. This allows the bladder wall to contract and removes from the suture line the weight of accumulating urine.

Analysis of the fifty cases here recorded, in which vaginal hysterectomy was done for procidentia, shows that the ages of the patients at the time of operation averaged fifty years. The average duration of symptoms was five years. Ten patients had each given birth to ten children or more; nineteen had each borne between five and ten children; seventeen had each less than five children; and four were nulliparae. Sixteen patients reported that their labors had been normal. Twenty-four had been delivered

by the use of instruments and six had been attended in labor by a mid-wife on one or more occasions. In forty-two cases the procidentia was complete; in eight the descent was incomplete, the vaginal portion of the cervix resting on the anterior margin of the perineum.

In the investigation of the present condition of these patients, thirty-eight were examined by Dr. George W. Blood, Dr. Ralph W. French, and myself. Eight reported by letter and four could not be traced. The following evidence was obtained: Thirty were found to have secured good anatomical results and were free from pelvic discomforts; seven reported well but were not examined; six complained of local discomforts and were found to have some degree of cystocele or rectocele. In none of these six cases, however, was there a descent of the vaginal walls below the pudendal fissure. There were three failures and four patients could not be traced. We have, therefore, direct or indirect



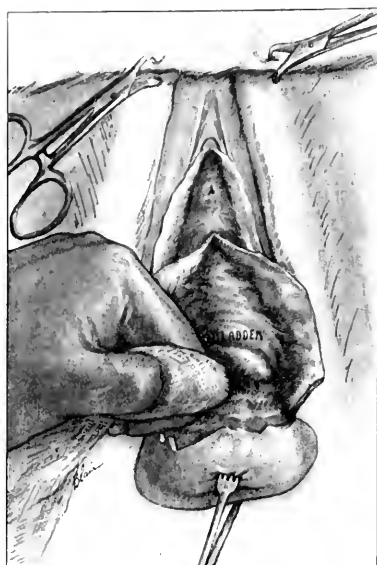


FIGURE 11.—Separation of the bladder from the cervix up to the peritoneal fold. The sponge-covered finger is here used for dissection.

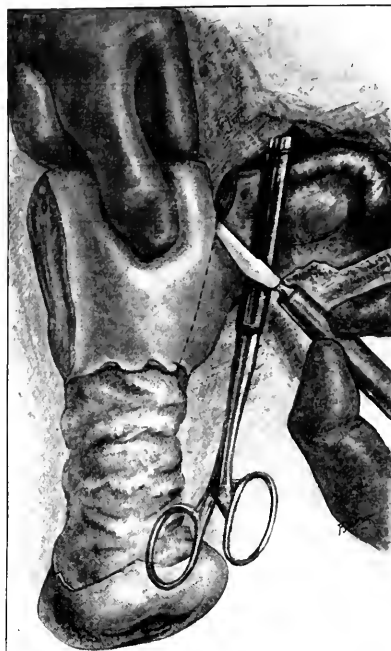


PLATE III.—A rubber covered clamp is applied to the broad ligament about 1 cm. from the uterus. Dotted line shows the depth of the vertical incision in the muscle of the uterine body. Note the greatly elongated cervix.

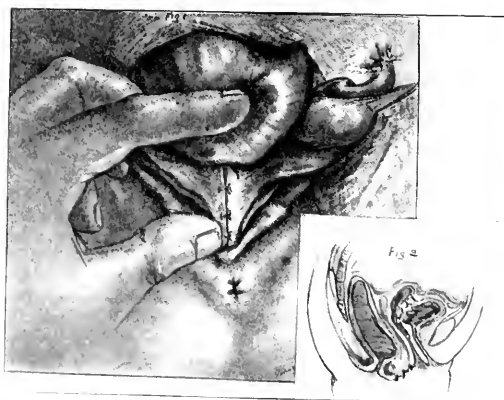


FIGURE 14.—Fig. 13. Uterine muscle brought together forming a central body for resistance to intra-abdominal pressure and a support to the bladder. Dependent portion of the bladder is sutured to the central line of muscle structure. Fig. 14. A lateral view shows the relation of the uterine muscle and bladder when the operation is completed.



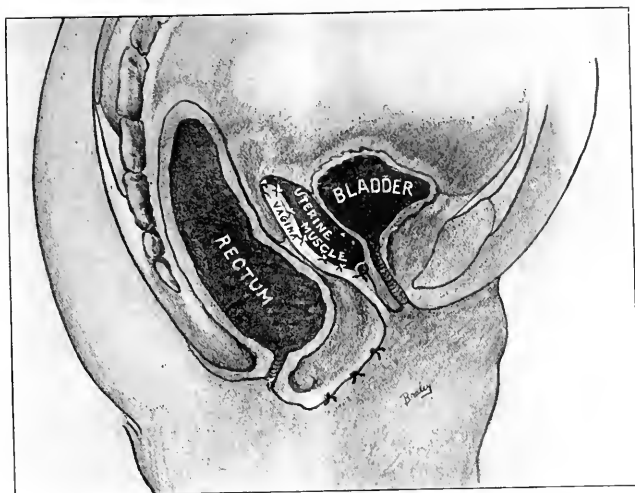


PLATE V.—Transposition of the uterine muscle body between the bladder and anterior vaginal wall.

evidence of complete success in 74%, partial success in 12%, and failure in 6%.

Although sufficient time has not elapsed for final opinion, the operation now done, as illustrated in Plates III, and V, has been employed with uniform success since January, 1915.

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## THE GENERAL PRACTITIONER'S APOLOGIA PRO VITA SUA.

By ANDREW F. DOWNING, M.D., CAMBRIDGE, MASS.

A LACK of unity among its members, and an excess of organization which threatens to become pathological are the ills that disturb to-day the peace and harmony of the medical profession. The general practitioner, beloved of other days, finds himself obliged to mitigate the presumption of his claim to medical knowledge by a proper sense of humility in the presence of the modern specialist. At the big medical meetings, he is confronted with a confusing list of section and sub-section meetings, and when, like a man without a country, he wanders aimlessly into a conference in the hope of gleaning some knowledge, he is too often obliged to listen to a dissertation on his own shortcomings. For him there seems to be no place. He appears to

be only a convenient *causa mortis* of the patients of specialism, merely an ever ready excuse for the advertising of that new human paradox of medical origin, the ethical quack. Occasionally he is praised for his heroism, seldom for his knowledge; but he has at last come to recognize that this, too, is the same brand of altruistic hypoerisy that vice so often exhibits when she generously pays public tribute to virtue.

There is a fable told of the man who invited the lion to be his guest and received him with princely hospitality. The lion was shown many things to admire, countless specimens of sculpture and painting, nearly all of which represented the lion in combat with man and in which the man was always victorious and the lion always overcome. After he had gone over the mansion, his host asked him what he thought of the splendors it contained. In reply he did full justice to the riches of the owner and the skill of the decorators, but he added, "Lions would have fared better had lions been the artists."

A propaganda, characterized by cowardly and insidious attack, that has for its purpose the commercial elevation of the specialist or surgeon at the expense of the good name of the general practitioner, cannot be allowed to flourish. The time has come for the lion to be the artist. The specialist has boldly thrown down the gauntlet to the general man, and the latter must pick it up.

The primary purpose of our medical organization is to further the usefulness and dignity of the profession. No reputable man is debarred, even though he be a general practitioner. Organization is the instrument of reform, the method of intelligent coöperation for the greatest good; while the lack



of organization means inefficiency, waste of individual effort, and absence of coöperation for the good of all. The result of the latter condition is victory for the enemies of reform and the triumph of a machine.

At the beginning I stated that we were menaced by excess of organization at the price of the unity of our members. Divisions into the specialties, and subdivisions into the branches of the specialties, have resulted in a chaotic mass of antagonistic smaller bodies that seem to have nothing in common but contempt for the man in the ranks. Now excess of organization means rigidity, uniformity, and mechanical perfection, that ultimately, unless properly safeguarded, results also in the triumph of a machine. Therefore, either from lack of organization or excess of it you face the machine, which may be a weapon of corruption, an enemy of reform, a means of subverting the common welfare to unintelligent or selfish ends. And while it would be perhaps unfair to say that in the medical world a corrupt machine has arisen which can be accused of unintelligent measures, nevertheless, it is true that we are confronted with a pseudo-aristocracy whose besetting sin is a selfishness that forgets the old-fashioned courtesy "which makes a man shrink from wounding the feelings of a brother practitioner."

The general man is aware of his many imperfections. Too often, perhaps, his increasing income results in complacency and inertia, until in his lotus land of secure mediocrity, he dreams only of dollars and eagles. And yet has he not like companions among the specialists? However, mental apathy is not the rule. The general practitioner rightfully feels that any successful and honest attempt to uplift the rank and file must be accompanied and even preceded by a similar movement to rid the field of specialism of its many mushroom growths.

The solution of the problem does not consist in giving to the public the untruthful impression that the general practitioner represents only mediocrity or inefficiency, and that the magic word "specialist" always connotes education, training, experience, competency, skill, culture, and intellectuality. The true specialist had his origin in the halls of learning in the days before commercialism began to exercise its evil influence. He did not, however, stand at the gates of his citadel and, beating back commercialism, mediocrity, and inefficiency, open them wide only for the man of merit. He did not protect his stronghold by driving out those who proved unworthy of the privilege of service either through incompetency or misconduct. Gradually he allowed his place to be usurped by many who were unfit, until his house was no longer the exclusive abiding place of rare skill and profound knowledge. The new specialism begot too many men whose ignorance and effrontery, by causing them to leap where

angels fear to tread, have done much harm to those efficient specialists for whom the general practitioner has the highest regard.

It is no exaggeration to say that never has the general man entered upon his work so well equipped as at the present time. It would be an exaggeration to say the same of the specialist, who in broad vision, skill, training, experience, culture, and the arts of thinking and of observation is seldom the superior of the general man, whom he dares to treat with contemptuous patronage. The man in the ranks would be cringing if he did not rise to protest against this brazen hostility that would be much more seriously offensive to good manners, were it not rendered so amusingly ridiculous by the sublime mediocrity of this era of rampant specialism. The general practitioner has always been patient with the specialist, because courtesy and common decency have forbidden him to "draw his frailties from their dread abode." If he is now in many quarters proving to be the David to whom the Kingdom of Specialism is falling, it ill becomes the specialist to look upon him as a king of shreds and patches. The general practitioner who, in his hospital days, has rubbed elbows with him who is now practising a specialty with a slovenliness that is the handmaid of ignorance, is not likely to be awed by the fact that such a man is the "rage" among a select group of society leaders. Moreover, he refuses to pay homage to that other anomaly of specialism who, after a course of beer-sipping and wine-tasting in Heidelberg or Vienna, returns to his friends "amid the crash of brass and the beat of drum," bloated with insolent conceit, and mottled with poisonous contempt for the lowly practitioner. In short, your general man has concluded that if the specialist would only spend his days and nights striving to reach a height equal in distance to the depths into which he would plunge him, specialism by extending its horizon would at last find the "blessedness of being little" and cease to be a danger to humanity.

"So waxes fierce the strife between these god-like men." "Shun the general man," shouts the specialist to the public, "for only with us lies the knowledge that leads to bodily salvation." "Beware the specialist," retorts the general man, "and the dead and maimed will be fewer in the land." Which is right? Neither. Somewhere between the bold assertion of omnipotence of the one, and the amusing assumption of omniscience of the other lies the truth. In the political and industrial worlds there are arising many problems the solution of which is taxing to the uttermost the intellects of our greatest leaders. Preparedness is the burning question of the hour. We, too, must be prepared, for the medical world has its own problems the solving of which will "stretch to aching the *pia mater*" of her combined leadership. The problem of the general practitioner is a



social one, inseparable from many others, which no single expert is wise enough to solve. It does not suffice to tell him that this refinement of organization is necessary for the good of all, while he feels that he is held in dishonor by the small group of individuals who reap the benefit. Many a strike has occurred in an industry which was effectively organized to increase material output, but which crushed the human nature of the workers until they were roused to rebellion. The general practitioners of today, with their excellent training, and exceptional opportunities for acquiring new medical knowledge, are becoming more and more conscious of their rights and dignity as members of the medical profession; and they resent the arrogance and truculence of petty men of inferior minds upon whom accident has too often bestowed the high places. They demand respect, not as a favor, but as a just right. They will not accept the dictum that the only escape from the ranks is death, but insist that he who possesses the skill, the knowledge, and the brains to enter some special field of work be not blocked by special privilege and outspoken contempt.

Herein lies the failure of specialism and herein lies an opportunity for our medical organization. We lack a department of administration that shall set and maintain standards of efficiency for all. To say that a man is qualified to do special work because of a few months' training in a hospital is ridiculous. The inefficient interne, without capacity for development, begins his professional life after graduation, the equal of the most proficient, and he may continue his career in the same condition with impunity. Abdominal surgery is being done by men notoriously incompetent, who graduated from hospitals of reputation. Yet there is no supervising authority in our medical organization to stay their hand. A surgical training as an interne, regardless of one's ability or qualifications, seems to be the only recognized ticket of admission to the domain of surgery; and the same is true of other special fields. And he who enters the inferno of general practice must, according to present-day standards, face the sentence that Dante inscribed over the gates of hell: "All hope abandon ye who enter here." Worse even than that of Tantalus is his fate, for after having entered the gates, he must look back and see his brothers, the specialists, like demagogues, haranguing the public on his ignorance and warning them off by pointing to the inscription over the abode he has just entered.

In the past decade we have undertaken to educate the public in many things medical. Political leaders have done the same in matters pertaining to government. The initiative and referendum, the recall of judges and executives, the minimum wage, the creation of boards of labor and industry, the passage of workmen's compensation acts, old-age pensions, the call

for constitutional conventions,—all are evidences of the people's demand for social justice. There are many who feel that a closer adherence to the landmarks of our fathers and a more honest administration of justice, according to the laws they framed, would have avoided all this clamor for social equality. The people, however, once aroused, are insistent on their demands and political parties are wise enough to heed their cry, and anticipate their uncanny intelligence in whatever concerns their welfare. Let the medical profession beware, lest their free public lectures prove to be dragons' teeth from which armed giants shall spring. Let us, too, awake from our apathy and anticipate the demands of the people by showing a willingness to grapple with a few of the problems that concern the public, as well as the good name and progressiveness of our profession.

First among these serious problems is one that we have grossly neglected. Our hospitals, public and private, are too far removed from the wise supervision of our organization. A supervising power, wise as the serpent and gentle as the dove, can never be obnoxious. Hospitals derive their right to existence from the people, and, therefore, it is our duty, through impartial and honest inspection, to protect the people by seeing that a proper standard of efficiency is maintained. The private or open hospital is where such inspection is most needed. Primarily a commercial venture, it offers to the inefficient an opportunity to hide a slovenliness of work that makes it impossible, as Osler says, "for that kind old friend Dame Nature to cover their mistakes." This is the curse of all hospitals with open staffs. It is true that the patients who enter such institutions are usually the well-to-do, whose knowledge of the world ought to enable them to choose men of skill. But the old saying "where ignorance is bliss 'tis folly to be wise" becomes a fallacy here, and a word in time may save more than nine lives. With no supervision, therefore, poor work is unconsciously encouraged and ideals are allowed to become forgotten things.

Here it is that many an unskilled general man falls into the slough of medical despond, where "besieged with sable-coloured melancholy" he grieves that a good surgeon was spoiled in his making. He deceives himself that surgery is just cutting, and its fatalities, like taxes, inevitable. His brain, slumbering unto death, is overcome by intellectual marasmus and ethical anemia; his conscience suffers a kypnosis; at last all "sense is apoplex'd"; and he who goes to bed at night a physician, awakes in the morning a surgeon, determined to have his share in the graft of human life. Think not that this is facetious exaggeration. The value of human life dwarfs all exaggeration and transcends the most extravagant hyperbole. The general man is not proud of these metamorphoses in his ranks, but he blames the conditions



that make them possible. As long as the Simon Pures are allowed to set the bad example of inefficiency by selling to the people surgical green goods, we must pay the shameful toll levied by those who will not hesitate to counterfeit these green goods. Happily there are many in the ranks of the general practitioners of whose work in surgery and other specialties their colleagues are justly proud. Particularly is this true away from the larger centres where the divine right of specialism is not recognized and medical feudalism is unknown.

In the case of our larger public or semi-public hospitals, the question of having an open staff should never be considered. Fortunately, in this community, such institutions are jealously guarded. Built as a rule by the people, and for the people, many of whom are poor and unfortunate, these monuments erected for the care of suffering humanity should be held sacred. The great body of solid general practitioners are strong supporters of the closed staff, because they feel a personal interest in the patient, that almost forgotten and yet most important figure in all our medical controversies. The general man realizes that by making the entrance gate to staff preferment in these hospitals narrow and difficult to pass, the exit for his patient to health and happiness will be broad and spacious. Therefore, a kindly supervision by our organization will harm no institution that it tries to help.

Some day the idea of publishing end-results will be hailed as a rock of safety for the people, and a God-send to the medical profession. Unless we take the initiative, the people, through their representatives, will compel hospitals from time to time to make a public statement of their standing, especially as regards mortality. The state throws its protection around our banks that the funds of the people may be properly secured, and even of their own accord, at various times, our banks issue a statement to the public press as proof that they are solvent. The funds entrusted to hospitals are human lives, and surely the public ought to know something about their disposal. Today, lawmakers are heeding the demand that our public servants be held up to a high standard of efficiency by expert investigation at stated intervals. This is because the people are insisting that in return for their money they receive efficient service. They have also a right to ask that in their hospitals, both public and private, their lives be protected by every possible safeguard. The American College of Surgeons is to be congratulated for its attempt to rouse the interest of the people in this respect, but, being an organization of surgical aristocrats, it is open to the charge of narrowness. If hospital reform is to become a serious business, the American Medical Association cannot sidestep the responsibility or look upon it as a

simple contract to be sublet to a group of subordinates, or to an independent corporation.

The federalization of our state boards of examination for admission to practice is another question that only persistent effort will solve. What matters it if defeat after defeat be our lot if undaunted we return to the fight? In numbers there is strength, but we seem not to have learned it. Witness our weak efforts in this state in favor of a clean milk bill, and in opposition to a bill to legalize the business of an herb doctor. What we sadly need is a leadership that will mould this great medical organization of ours into a powerful engine of aggressive efficiency in legislation and in medical progress, that will protect the lives and the health of our people and bring to us their undying gratitude and unsolicited support. To conceive our medical association as such an instrument challenges the imagination and provides for envy, hatred, and malice among our members a speedy and happy death. History shows that the course of events in human affairs under a hand-picked leadership, like labor, consists of three stages: feigned enthusiasm, apathy, and rebellion. We are still in the long second stage. Legislative hearings on medical matters attract but few of the many, who by convincing and dignified argument, might save our cause from defeat and give much needed strength to our whole body. Only by an organization, working in a spirit of harmony and brotherhood, can an antiquated system that controls the entrance to the profession be abolished. This is the first step towards an honest efficiency system that will discriminate against neither Trojan nor Tyrian. Call this socialistic if you will, but it is progressive and neither fanciful nor impossible. It may involve constant experimentation with new methods of investigation and examination, but progressive aims involve the responsibility of finding progressive men and devising progressive methods.

The present agitation in favor of group medicine, so-called, deserves a word. Heralded as a reform, it is really one of the many proliferations of medical imperialism that, in our present state of organization, threaten serious danger to all. To disguise such a system with the simplicity of an eternal verity and to deceive the people by this specious cry of "Better doctors for less money," ring no more true to sound ethical principles than the screaming posters, so offensive to the eye, that advertise the fake fire sale in our cheaper stores. If many of our important medical problems are to be solved by socializing our organization, as some believe they will be, then the fate of honest and efficient medical service and the fate of the good name of the general practitioner are linked with



the fate of a medical democracy. If group medicine is to be what it now pretends to be—better medical service, and not medical panhandling—it is an important instrument for the welfare of the people, and its success will be linked in large part with the efficient supervision maintained over it by wise and impartial medical leaders. This is the secret of the success of an institution in this country that is considered a model of the group medicine idea. Time and again men have tried to copy it only to meet with absolute failure because their eyes were focussed on a vast surgical clinic with its enormous financial returns. They failed to visualize the wisdom and the strength and the courage of the leadership that made a medical democracy the foundation of a marvelous efficiency. Its financial success therefore is resultant, not causative.

Although in the abstract, group medicine may be a good thing, in the concrete, if the members of your group are incompetent or dishonest, it is worse than the condition it hopes to remedy. Like inefficient schoolhouse inspection that rouses a community and causes the people to look to the man responsible only when a fire occurs and innocent children are burned to death, so inefficient or dishonest group medicine that results in some fatal mistake may fan the flame of moral indignation and cause us too late to wake up to the inefficiency of those responsible. It is the same question that is emblazoned on the walls of every hall of medicine. Who is responsible? A little foresight, a little social imagination, will prevent many a medical calamity if we will only recognize the importance of true medical preparedness, which first means the highest possible efficiency of those to whom we entrust fundamental responsibility. Such a progressive system of administration will stimulate each individual to make himself more efficient and then it will be easy to value him according to his merit. The cry of "better doctors for less money" will cease to make us blush, for with the dead wood eliminated, only those with superior qualifications will be found in responsible places, and the general man will be the last to complain.

At present the general practitioner has a just grievance, since the supporters of this new idea, besides praising it as a bargain suggest that it supplants his incompetency. With the advent of the medical bargain, the marked-down funeral will become popularized, and between them the casket trust will be vanquished. One group of these altruists offers to send back the patient to the general practitioner with copious reports and directions for treatment, but they make no mention of car-fare. With group medicine today there are treacherous possibilities. The layman with financial genius is given an opportunity to invade the field of medicine by establishing, forsooth, the Great Arctic and Antarctic Group Medicine Company, with offices in every city and large town. By buying cheap in the open market

quantities of group talent, he will be able to do a prosperous business on a small margin of profit. The young man just out of training will often, through financial distress, be drawn into this system and compelled to sell his skill and knowledge to the figurehead who is planted in the midst of rich mahogany. Rival firms will vie with each other in devising new ways of advertising, and medical ethics will die in the stranglehold of commercialism.

The general man's idea of efficient group medicine is consultation with—what now seems to be considered an old-fashioned institution—the learned internist. For him it is the original, most serviceable, true and tried method of seeking light in dark places. The good internist is worth a dozen groups and more. The misfortune is that there is not enough of him. The general man is always glad of his opinion, and if the surgeon and the specialist would consult with him more frequently, they would be saved from many a foolhardy venture. Never was he so much needed as he is to-day to deliver some of our specialists and surgeons of pride and covetousness and envy, and to encourage the general practitioner to stifle his bitterness and keep "his heart still pregnant with celestial fire." He it is who typifies the master mind in medicine, that ability in diagnosis acquired only by a life of ceaseless intellectual training, and that human sympathy which distinguishes only God's own gentlemen. To know him is to love him, and in the spirit of the tribute Dick Steele paid to Lady Elizabeth Hastings, "To love him is a liberal education." May the specialist soon learn to love him!

What the general man then demands is that surgeon and specialist be held up to a high standard of efficiency.—a standard at least half as high as they would require for him. Physicians, be they surgeons or specialists or general practitioners, are good or bad, honest or dishonest, cultured or not cultured, efficient or inefficient. These are the only recognized lines of social cleavage in a true medical democracy. Let us have social justice combined with old-fashioned culture and courtesy, and let us have more boosting up and less pulling down; because, in the language of a philosopher, "Intelligent self-sacrifice of the strong to the weak, makes the strong stronger and the weak more strong. To him that hath the capacity to receive shall be given the priceless boon of opportunity, and from him that hath not shall be taken away the power of degrading himself and society." The general man has had enough of gibes and insults, and "the spurs that patient merit of the unworthy takes." He is no longer a child in the go-cart. Like Ibsen's Nora, he is weary and disappointed in this doll's house that has been erected above him, and unless his brothers are willing to level it to its foundation, like Nora, too, his self-respect will compel him to leave many things that he cherishes and seek in his own way intellectual independence.



## Clinical Department.

### ANESTHESIA.\*

By EDWARD L. YOUNG, JR., M.D., BOSTON.

DURING the time from the first introduction of ether up to within a comparatively recent date, the art of anesthesia consisted mainly in rendering a person unconscious and if possible relaxed, and that part of any operation was performed by a subordinate, often the youngest man on the team, who had a very imperfect knowledge of the work. Within recent years more and more attention has been paid to this very important part of surgery, and not only has the standard of the etherizer been very much raised, but the means at his command, in methods and sequences of drugs, been greatly increased. Both because surgeons are realizing the importance of anesthesia and because in certain methods they have an active part in that process, they are coming in closer touch with the etherizer and with the various modifications he uses. But it is not enough to have a highly trained specialist at our command; we must know enough about the effects of the drugs to know what is best for our patient in any given operation; the details of administration we can leave to the man behind the cone. We must be willing to give a reason "for the faith that is in us," and so I am going to discuss here the drugs and sequences with which I am familiar in hospital and private practice.

First to enumerate some of the effects of the drugs on the human organism. Ether is an irritant to the respiratory tract; when the lungs are normal this irritant action expends itself on the mucous membranes of the larynx, trachea and upper bronchi with the production of an abnormal amount of mucus; but not always, for in a certain small percentage of cases there are, even in normal healthy adults, pneumonias following etherization which though perhaps not entirely due to ether, certainly would not have occurred without it. And in elderly people or anyone with damaged lungs this action of ether is of the greatest importance.

Ether is an irritant to the kidneys. In any series of cases carefully studied before and after operation, the urine will show evidence of renal disturbance, indicated by albumen and casts, in from five to twenty percent, of cases where supposedly normal kidneys were present. According to Miller's work the function of the kidneys is depressed following etherization in direct proportion to the amount of ether used; the decrease going from 9.9% with small amounts of ether to 26.3% where large amounts were used.

Ether first raises and then lowers blood pressure; it likewise acts for the first half hour as a stimulant and then as a depressant. Ether very markedly diminishes phagocytosis and the

agglutinating power of the blood. Ether has no harmful effect on the heart if rightly given; it is not contraindicated where cardiac lesions are present. Ether is disagreeable to take and is apt to be followed by a considerable degree of nausea which, aside from its discomfort, is not without danger in head cases and cases of increased blood pressure from any cause. The margin of safety with ether is very wide and it comes nearest of any of the general anesthetics to being "fool proof." The immediate mortality of ether is not far from one in five thousand in this country, according to collected statistics, and according to Hewitt, one in sixteen thousand in England. The higher mortality in this country may be attributed in part, at least, to the fact that any Tom, Dick, or Harry has been considered good enough to hold the cone.

Because of its low mortality and very wide margin of safety, ether is the anesthetic of election in the majority of routine surgical cases. Preliminary medication of a hyperdermic injection of morphine and atropine helps in a quieter and more rapid induction of unconsciousness. The use of gas to put the patient to sleep and then the substitution of ether is much easier for the patient, and in so far as it lessens the stage of excitement and the amount of ether used is likewise safer. A certain amount of rebreathing is probably necessary to preserve the  $\text{CO}_2$  balance in the blood, and whether or not we follow Yandell Henderson to his final conclusion and believe that the diminution of  $\text{CO}_2$  in the blood, apnoea as he calls it, is the cause of shock, clinical evidence proves that patients do better who do have the optimum amount of rebreathing. This does not mean that the drop method is to be dispensed with; in fact it gives one of the reasons for the obvious advantage of most face masks, namely, that just enough rebreathing goes on and not, as in most closed cones, far too much as well as periods of too great ether concentration. As with Henderson's theories, so with Crile's, we are not obliged to follow him in all of his experimental and theoretical details and conclusions in regard to anoxi-association, but the clinical facts seem beyond dispute; that when local as well as a general anesthetic is used, patients are better relaxed with less ether, there is less shock from the operation, and the post-operative course is much smoother.

Chloroform need not be discussed, as the cases in a well-equipped hospital, where a safer substitute cannot be found, are very few and far between.

Nitrous oxide gas can be used for all minor operations requiring but a very short time for their completion, and used as such, it is by far the safest anesthetic. Mixed with about eight percent of oxygen to prevent cyanosis, gas can be used for operations of any duration in the majority of individuals. Used in this way the gas and oxygen mixture presents the following conditions:

\* Read before the Fortnightly Surgical Club.



It is not irritating to the lungs or kidneys.

It has no bad effect on the heart except in so far as it causes cyanosis, in other words is poorly given or is administered to an unfit subject.

It tends to raise blood pressure slightly except at the end of long operations.

It is easy to take and recovery is quick and with few, if any, symptoms.

The margin of safety is very narrow.

The immediate mortality varies according to the skill with which it is given. In the hands of experts it has been very safe. Various men report very large numbers without a single death directly attributable to the anesthetic. But it is very easy to step out of the safety zone and in the hands of careless or inexperienced operators, the mortality, is, I believe, extremely high, far higher than any of the other anesthetics in general use. Up to the present time in Boston, I believe the mortality is well over one in a thousand. But unlike the conditions with chloroform, the dangers here are largely if not entirely avoidable, at least if we can believe the experience of certain men who use it almost exclusively. The one thing that is emphasized by these experts is the color of the patient; with the face a pink color, no accident can possibly happen, while the minute any cyanosis develops the danger zone is in sight. And this gives the clue to the limitation of the anesthetic; if the patient cannot be anesthetized satisfactorily without cyanosis, then he cannot be anesthetized safely with gas and oxygen alone. It is possible, however, to add a small amount of ether without any of the irritant effects of the drug, and yet with enough additional anesthetic effect so that the gas and oxygen need not be entirely abandoned and yet the patient kept pink. Any attempt to force the gas oxygen in the face of insufficient anesthesia and slight cyanosis, is very apt to result in increasing cyanosis and respiratory embarrassment, and if still persisted in, will result in sudden cessation of the respiration and then very quickly of the heart, both beyond the point of return. Preliminary medication is of the highest importance in securing the most satisfaction both in comfort to the patient, and especially in attaining complete anesthesia without danger. The amount of morphia varies from three doses of one-eighth of a grain at three quarter of one hour intervals, to three doses of one-sixth of a grain given in the same way. The last dose carries with it a moderate dose of atropine. The amount of morphia depends on no rule of thumb; the only thing is to give enough to have the patient distinctly drowsy when he comes to the operating room, and to do this the effect of the first and second injections must be watched and the next dose increased or decreased accordingly. The use of scopolamine is not necessary and certainly adds to the risk of anesthesia where the morphia alone just as surely decreases the risk. In fact, the morphia can well be used with any anesthetic with perfect

safety and a more satisfactory anesthesia. The use of the local anesthesia with the general, Crile's technique, is likewise of great assistance in the use of gas and oxygen as much less of the general anesthetic is necessary than where no local is used. Gas and oxygen anesthesia is indicated in all cases where there is any obvious lung irritation, or any reason to think there may be a latent lung process, as in surgical tuberculosis of any kind. In cases with severely damaged kidneys, it is likewise to be preferred. Contrary to the usual dictum, I believe it is the safest anesthetic in old men with "weak" lungs and atheromatous blood vessels, if there is also any marked kidney damage, and with increasing skill in administration, it may be the safest under any condition. At the present stage of development, it should not be used merely for comfort's sake, but only in the face of a definite indication and then only by a skilled anesthetist.

#### SPINAL ANESTHESIA.

This is of more limited use as it cannot safely be used above the level of the pelvis. The difficulties are in its administration and the danger lies in the spread of the drug upward along the cord, until it reaches and paralyzes important nerve roots. Clinically, this is manifested by an alarming fall in blood pressure with all the signs of serious collapse. According to Smith's work, if the origin of the dorsal sympathetics supplying the splanchnic area are hit, the danger arises. Beyond these immediate symptoms there have been no untoward late effects. The great advantage is that all stimuli to the brain are cut off and shock is much lessened. The mortality has been high, though no accurate figures are available and it needs a skilled man to administer it, and because the patient is not unconscious, psychic shock may be considerable in nervous people.

If the anesthetist gives the drug with the experimental facts of Smith's work in mind, the collapse can be almost entirely if not completely avoided, and the mortality brought within reasonable limits. The details of such an administration are as follows: The drug used is 5 per cent. novocain with adrenalin; the dose from  $1\frac{1}{4}$  cc. to  $1\frac{3}{4}$  cc.; the injection should be made not higher than the third lumbar interspace. The drug should be diluted with equal parts, or at most, with two parts of spinal fluid, and this mixture must be put in very slowly. The Trendelenberg position should not be used for at least ten minutes. In short, every attempt is made to localize the effect of the drug low in the canal. The patient can be either on his side or sitting up for the injection.

This is a very valuable form of anesthesia in a limited field. For cases of great vesical irritability needing cystoscopy, it is invaluable as the paralysis of the motor nerves allows of the maximum dilatation with safety as well as without sensation. In perineal prostatectomies it



can be used with perfect satisfaction to patient and surgeon. In amputations of the legs for gangrene in diabetes it is also indicated. It can of course be used for any operation coming within the field of anesthesia, but it should be reserved for those cases where a definite indication exists. Caudal anesthesia has no advantages over spinal and is more difficult to give.

#### LOCAL ANESTHESIA.

This form of anesthesia has gained in importance since the introduction of novocaine, which can be used in almost unlimited amounts in a one-half per cent. solution without any danger of toxic symptoms. Practically all the operations of surgery have been performed by some men, with the use of local anesthesia, and while that is not necessary or even desirable in the majority of cases, it shows what can be done. There is a definite and, as our skill increases, probably broadening class of cases in which local anesthesia is, or will, become the anesthetic of election. But here, as in spinal anesthesia, a conscious patient must be considered, and that fact alone contraindicates the use in individuals of a certain type. Considerable practice and patience are necessary to make this form of anesthesia a success. It is indicated today in all operations on the scrotum or its contents, as the nerves can be easily and completely blocked, and on very minor operations. Operations on the fingers can be easily performed by blocking the nerves at the base of the finger.

To summarize: A surgeon should make every attempt to pick out for each patient on whom he operates the right anesthetic, which should be given for a definite indication.

### THE TREATMENT OF PARESIS BY INTRA-VENTRICULAR INJECTIONS OF DIARSENOLIZED SERUM WITH PRESENTATION OF CASES.

By PHILIP COOMBS KNAFF, A.M., M.D., BOSTON.

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A fairly large experience with the treatment of syphilitic affections of the central nervous system by intra-spinal injections of salvarsanized serum by the Swift-Ellis method and its modifications, begun in my service at the City Hospital by Dr. Sanborn about three years ago, has shown that in no other way have I ever obtained such constantly good results. This opinion has been reached from the study of about five hundred injections on over a hundred patients, with pretty constant benefits, with no bad ef-

fects other than a temporary increase of pain, except in one case that died suddenly soon after injection from causes not fully determined. Among these cases, of course, were a goodly number of paretics and cases of cerebral syphilis. Although many of these cerebral patients showed a very considerable improvement, I have never seen such striking benefit as in the spinal cases. I have seen tabetics, who could stand only by the support of two nurses when treatment was first begun, who after a few injections could walk several miles with an approximately normal gait. I have seen a patient, completely paraplegic, with total loss of control over the bladder and marked anesthesia, leave the hospital walking normally, with complete control of the bladder and with normal sensibility and reflexes after three injections. Such brilliant results I have not seen in cerebral cases.

My own experience is like that of most observers and has led me to accept the hypothesis that the action of salvarsan, and its substitutes—neosalvarsan and diarsenol—is most pronounced when it is exerted most directly upon the spirochaete, wherever may be its lair. I was therefore much interested to learn from Dr. Graeme Hammond of his attempts to accomplish this result and later to have a practical demonstration of the methods employed by him and Dr. Sharpe as reported by them a year ago,<sup>1</sup> and to see the benefits obtained in several cases which were shown me by him at the Post-graduate Hospital in New York.

Experiments seem to indicate that the cerebro-spinal fluid is subjected to some form of circulation or is not confined in a single cavity, but in separate enclosures in the cerebro-spinal canal. Not only does its physical and chemical constitution seem to differ in different parts of the cerebro-spinal axis, but if a substance be injected into it in one place it does not become gradually diffused through the whole fluid, but exerts only a local action near the point of injection, and is gradually eliminated from the fluid. Tilney,<sup>2</sup> for example, found that pigment injected into the veins was not much diffused through the cerebral cortex, and Goldmann,<sup>3</sup> that injections into the lumbar regions of the spinal canal were not fully carried up to the cortex. Symmers<sup>4</sup> went a step farther and found that solutions injected beneath the cerebral dura had much more difficulty in diffusing and were much more rapidly drained out of the cranium than if they were injected into the lateral ventricle. By any method of approach it is probable that some of the injected substance reaches the cortex, but not so fully or so completely as by the ventricular route.

Attempts have been made to obtain the action of salvarsan on the cerebral cortex in paresis by all of these routes. We are all familiar with the attempts to treat paresis by the intra-venous and intra-spinal methods, and I think that most will agree that, although our treatment is often



attended with some good results, it is not so satisfactory as is the treatment of spinal affections. Marinesco<sup>4</sup> and Cotton<sup>5</sup> have tried the injection of salvarsanized serum beneath the cerebral dura with considerable benefit. Hammond and Sharpe have given intra-ventricular injections to a number of patients with very considerable benefit and no bad results, one or more of their patients being able, after three injections, to return to a business which involved considerable mental application. Ballance<sup>6</sup> and Fister<sup>7</sup> had previously tried a similar method with fairly good results.

The operation is comparatively simple. A small trephine hole about half an inch in diameter is made just in front of the bregma and an inch to the right of the median line. The dura is then incised so as to give an opportunity to select a spot free from large cortical vessels and a blunt-pointed cannula is inserted downward and backward about six to seven centimeters into the lateral ventricle. Hammond has usually found the dura very thick and opaque, but such has not been my experience. Ten to twenty cubic centimeters of cerebro-spinal fluid is then slowly drained off and an equal amount of serum, containing .6 to .8 milligrams of salvarsan, neosalvarsan or diarsenol is allowed to flow in very slowly and gently. The wound is closed in the usual way. Subsequent injections are made directly through the scalp. Hammond does this under local anesthesia from novocaine, but I have preferred to etherize the patient again rather than run any risks. Hammond gives a second injection in two weeks and a third four weeks after the second. Neither of us has as yet seen any unpleasant results from the operation.

The first patient entered the hospital February 7. He was extremely demented and it was felt that nothing could be of much benefit. He was an Irish coal heaver of forty, barely able to read or write, who denied syphilis. For a year and a half he had been apathetic, dull, neglected his work and was careless and filthy. He was untrustworthy and uncommunicative. There was loss of sexual power. The pupils were unequal, irregular and usually did not react at all to light, although occasionally there was a very sluggish reaction. The left leg was spastic and the left knee-jerk lively, the right absent. The speech was slow and slurring, the hand-writing illegible. He was silly, apathetic and disoriented and could remember but little. He was somewhat euphoric and always felt "fine." The blood and spinal fluid gave a triple positive Wassermann reaction, the fluid showed no increase of pressure, a cell count of 25, positive globulin and a negative colloidal gold reaction.

On March 10 he was given an intraventricular injection of serum containing 0.6 mmg. of diarsenol. The ventricular fluid removed was contaminated with blood so that the usual tests could not be made, but a negative Wassermann was reported. Nine days later he was much brighter, recognized a nurse and called her by name, took more interest in what was going on, talked more clearly and

wanted to go home. The knee-jerks were lively, but unequal, and he wrote more legibly.

On March 29 the injection was repeated. The fluid removed showed a negative Wassermann, the cell count was 15, the globulin double positive, and the colloidal gold a paretic reaction. It also contained some large (plasma?) cells. After this he seemed still brighter, was interested in what was going on, talked cheerfully and more clearly, and the pupils reacted promptly. On April 3 he was discharged. Since then he has returned temporarily to his work and seems more reasonable at home.

The second patient was admitted March 2. He was a drug clerk of forty who had contracted syphilis eighteen years ago. He took medicine by the mouth for eight or nine months, and during the last two months he had had thirteen doses of diarsenol intravenously. For over a year he had complained of tremor and loss of memory, but under his recent treatment the memory had improved. The memory, however, was poor, he was a good deal disoriented, and he made many mistakes in simple calculations. There was a good deal of slurring of speech and the handwriting was characteristic. There was tremor of the tongue and hands, the reflexes were lively, and the pupils did not react to light. The blood and spinal fluid gave a triple positive Wassermann, the cell count was 84, the globulin triple positive and the colloidal gold suggestive.

He was given, March 15, 0.6 mmg. diarsenol in serum by injection into the lateral ventricle. After this he seemed considerably brighter; he did simple sums correctly, he remembered better, the tremor was less, and the pupils reacted promptly to light. On March 29 the injection was repeated, and he has continued to do well. The ventricular fluid removed at the time of the first injection showed a negative Wassermann, a cell count of 20, double positive globulin, and the colloidal gold showed the reaction of paresis. The fluid removed at the time of the second injection showed negative Wassermann, a cell count of 5, positive globulin, and a paretic reaction in the colloidal gold test.

It is too soon and our experience is too limited as yet to permit us to come to any conclusions as to the merits of this form of treatment. The operative procedure seems to be fairly safe and the risks are apparently slight. The changes in the physical signs,—the return of the knee-jerk, the reaction of the pupils to light,—are not often seen in paresis under treatment, and, taken in conjunction with the apparent general improvement encourage me to continue with this method.

In conclusion, I would express my gratitude to Drs. E. H. Nichols and G. P. Sanborn for their hearty coöperation.

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## THE STATUS OF THE FEEBLE-MINDED QUESTION.

THE general interest in the question of the detection and of the disposition of the mentally defective has now assumed such large proportions that we are very likely to be led into the belief that the matter is quite a settled one, and that only the administrative parts remain to be carried out. Yet we are quite in the infancy of knowledge on this subject. We are entirely in the experimental stage. It is true that we no longer think of all mental states in terms of one amorphous mass. New divisions are continually being carved out as we differentiate one variety or one degree of mental invalidism from another. Indeed, progress thus far has been almost entirely in this direction. Until 1905, when Binet proposed his now famous scheme for determining and for separating the feeble-minded children from the normal children by comparing them with standards of

mental ability for each age, the feeble-minded question had no existence. Since this announcement the scheme and, indeed, the whole subject has aroused a tremendous interest. The momentum it has attained has, unfortunately, sucked into its path a great many unscientific persons. They expect too much of it, and overlook the vital points entirely. The Binet system is often utilized as a hard and fast rule to determine, not only the existence of mental deficiency, but also the quantity, even up to a fraction of a year. It is obvious that the mind is too flexible to allow of any such definiteness. A standard should be an aim not to be attained, otherwise progress in mental evolution will be overlooked. A scale that will determine and separate the feeble-minded from the normal, that will remove them from being impediments to the progress of the normal, and that will prevent the forcing of expensive educations on inviolated minds, must be preëminently a flexible one.

The Binet scale of measuring intelligence has undergone a great deal of modification, until now very few of the scales in use look like the original. Besides, most observers have constructed scales of their own, on the same principle but different in detail. Nearly all of them provide for a scoring method, whereby failures in problems that should be done at a certain age, and which would relegate the child to a lower mental age, are neutralized with credits for negotiating some of the problems given for a higher age. All of the methods aim to add to the range and to the adaptability of the questions, so that there will be more flexibility in their application. The very numbers of the modifications themselves demonstrated that none of them is everywhere applicable. Some of the tests are too easy, others too hard, still others too few, from which to make an intelligent determination. Many of the tests are merely hobbies of individual examiners. The more tests the more confusion there is. Furthermore, the Binet tests and their modifications were originally intended for children of one school type. They are not quite so applicable to the mixtures found in American schools. They have less applicability to children above school age. It is difficult to construct a Binet scale for the later years because the range of knowledge keeps ever widening.

Moreover, the difficulty of constructing a suitable measuring scale is further complicated



by the fact that only in the profoundly backward are all the faculties retarded. These hardly need a Binet scale to determine this question. There are higher grades of defectives rising to the normal, and even above, in whom the retardation is only partial, in one or more faculties; and in the others they may even excel. These children must be recognized, and their normal faculties brought out and perhaps measured. The practical and applied psychologist can aid in this work with his laboratory. Unless this is appreciated, such children may be relegated into the class of the unfit because they fail in some of the tests for their age, when in fact they may be geniuses in some special faculty. The later measuring scale methods aim at this very question. Whether material, physical or mental, true economy lies in picking out the good parts of a mass, no matter how small it is. Nothing good must be wasted merely because it is buried in the bad. This takes time. One sitting with a stereotyped measuring sheet, perhaps in the hands of the inexperienced, is not sufficient to make so important a determination.

On the other hand, it is important that some system, standardized periodically, and sufficiently flexible, be constructed in order that the many surveys undertaken should have some uniformity of principle, and in order that results can be read and interpreted alike everywhere. Those interested vitally in this problem, whether they are mental hygienists, health officials, school physicians, criminologists, or the like, ought to agree on a selection of the best of the many methods and plans already submitted, or the adoption of new ones. In this way would a vastly important question be on the high road to solution.

rails against such delays take heed lest he himself is unwittingly the offender. A little over-cautiousness in making diagnosis, too much manipulation of gut, a too meticulous technic, or a failure to cultivate ambidextrousness may turn the balance between life and death.

In the *British Medical Journal* for April 15, Dr. R. P. Rowlands calls attention to these dangers. He believes that the time used in employing a needle-holder is, as a rule, wasted time, and he pleads for simplification of the technic in every possible way, deploring the modern tendency to over-refinement of method. Rowlands does not think that the surgeon should take time during an operation to explain its steps to an onlooker, but rather wait until all is over.

In the May 6 issue of the same periodical Dr. Edward Harrison corroborates his colleague's remarks, and goes into some detail as to time-saving methods. He thinks perfection of co-operation among the hospital staff may accomplish wonders in this way, and recommends frequent drilling of the operating-room force. He suggests that surgeons take a course in sewing from some female relative to improve their speed and accuracy; another hint is the acquirement of the art of tying a knot with one hand. The self-threading needle and the round-pointed knife he speaks of as valuable time-saving adjuncts, and takes up the opening and closing of the abdomen for an appendectomy to illustrate the points.

It would be well for American surgeons, who as a whole are probably the speediest in the world, to exchange time-saving ideas; for even those which the metropolitan surgeon regards as the most inconsiderable may be valuable to surgeons in remote districts who are unable to attend large clinics, and who do not operate often enough to evolve them for themselves.

## THE TIME ELEMENT IN SURGERY.

WHILE few can sympathize with the mental attitude of the surgeon who works with one eye on the clock, as the saying is, it has probably been the experience of all to see valuable minutes going to waste in the operating room while waiting for preparations which should have been made before the first drop of anesthetic was given. But let the surgeon who

## A NEW BUILDING FOR THE MASSACHUSETTS COLLEGE OF PHARMACY.

THE Massachusetts College of Pharmacy is actively planning for a new building, to be erected on the fine site purchased a few years ago at the corner of Brookline and Longwood Avenues, Boston, very near the new buildings



of the Harvard Medical School, and in the great center of medical education and practice that is being developed in this part of Boston. The building, as shown, is to be of an impressive character, that will add much in the eyes of the general public to the dignity of the profession of pharmacy.



This College is in possession of an endowment amounting to \$240,000, but no part of the principal of this fund is to be used. The new building with its equipment, exclusive of its site, will cost in the neighborhood of \$200,000, of which a part is to be obtained by the sale of the present building and its site, and a part is being raised by a campaign now under way.

Dr. Frank Piper, chairman of the ways and means committee, announced at a recent meeting of his committee that he had received a gift of \$50,000 on condition that an amount sufficient to construct the building was secured. He also stated that the friend who made this large donation, while desiring to remain incognito for the present, had by his generosity practically assured the early beginning of work upon the new building.

#### MEDICAL ASPECTS OF THE MEXICAN SITUATION.

THE great European War has now lasted for nearly two years, and to the ordinary perception there is no immediate indication of its ending. Though many persons feel, or at least express, confidence in the manner of its termination, to impartial observers its outcome still seems as much as ever on the knees of the gods. Naturally, as members of a dispassionate pro-

fession and citizens of a neutral country, American physicians, whatever their personal sympathies, have been largely interested in the medical aspects of the great war. For this reason, the JOURNAL will continue, during the coming season, the publication of its column of European War notes, in which items of interest from this point of view will be presented from week to week.

The United States is now menaced, more acutely than at any time since April, 1914, with the incidence of a second Mexican War, which at the present writing seems likely of declaration within a short time. In the several states throughout the Union during the past week, the militia, or national guard, has been mobilized, with the demonstration of varying degrees of efficiency and preparedness. A number of these militia units have already been dispatched to the Mexican frontier. Whether or not this mobilization proves to be the precursor of actual war, the Mexican situation is not only of intense concern to all Americans, but in its medical aspects affords to the American profession matter of import for action, as well as observation. The occasion and opportunity have arrived when the medical corps of the army and navy, the medical officers of the national guard, and, in the event of extensive hostilities, civilian members of the profession will either demonstrate or fail to demonstrate their fitness to deal competently and creditably with the medical urgencies that arise in time of war; and it is most earnestly to be hoped and expected that this demonstration will be in every respect a credit to the American profession.

In its present issue the JOURNAL begins the publication of a column of Mexican notes dealing, after the analogy of the European War notes, with topics of medical concern connected with the Mexican situation. In another column of this issue of the JOURNAL is published also the recent announcement of the American Red Cross in connection with its activities in preparation for a possible Mexican War. Unlike law, medicine speaks with an even stronger and more authoritative voice in times of war than in times of peace; and in Mexico, as well as in Europe, the work of our profession will be not only to succor the injured, but to maintain the standards and purposes of civilization through the inevitable barbarisms of war.



## MEDICAL NOTES.

**AMERICAN MEDICAL ASSOCIATION.**—At the recent annual meeting of the American Medical Association, Dr. William J. Mayo of Rochester, Minn., was elected president in succession to Dr. Rupert Blue.

**ROYAL SOCIETY OF CANADA.**—Dr. A. B. Macallum, professor of physiology at the University of Toronto, has been elected president of the Royal Society of Canada.

**NATIONAL ECLECTIC MEDICAL ASSOCIATION.**—The annual meeting of the National Eclectic Medical Association was held at Cedar Point, Ohio, on June 23. Dr. W. E. Daniel, of Madison, S.D., was elected president for the ensuing year. The next convention is to be held at Nashville, Tenn., in 1917.

**POLIOMYELITIS IN BROOKLYN.**—According to the figures compiled by the Department of Health, there are now 114 verified cases of infantile paralysis in Brooklyn, practically all of them in the old South Brooklyn section. Eight cases were reported from Manhattan so far this month. The outbreak appears to be confined to infants and young children, less than 10% of the cases occurring in children over five years of age. While some of the cases recently reported are really old cases, whose onsets date from May, others are of recent development; the latest onset thus far reported is June 19. It was natural to suppose that the schools had a share in spreading the disease, but at the Department of Health it was stated that a careful investigation had failed to substantiate this view. It was pointed out that over 90% of the children were under school age; that the cases were not limited or even more prevalent in any one school district, and that they were not at all limited to children in the same classroom. Because of the relation alleged to exist between poliomyelitis and the stable fly, a survey has been made to determine whether the cases thus far reported are at all in the vicinity of stables. This part of the investigation is still in progress. In the mean time, the Sanitary Bureau is taking special pains to see that the manure in all of the stables in the affected districts is properly disposed of to prevent the breeding of flies. One case was reported to the Department from Staten Island. It is rather interesting to note that this case, like most of the Brooklyn cases, is also in an Italian district.

According to a bulletin issued by the Department of Health, thirty-seven additional cases of infantile paralysis were reported to the Department of Health on June 26, making a total to date of 183 cases in Brooklyn. A study of the situation indicates that the disease is spreading in a southerly direction and is invading the Parkville section, to the east of Bay Ridge. Of all the cases thus far reported, none of the pa-

tients are over eight years of age. There was a rumor current that the Department of Health planned to close the schools, but this was denied by Health Department officials.

From the figures compiled by the Department of Health, it appears that during the past week 12 deaths were reported from anterior poliomyelitis (infantile paralysis) in the Greater City. Eleven of these deaths occurred in the Borough of Brooklyn, almost as many as occurred in the entire city during the year 1915, when 13 deaths from this disease were reported for the entire year in the Greater City. There was nothing else noteworthy in the mortality from the other causes during the week.

There were 1311 deaths reported from all causes, as compared with 1277 reported during the corresponding week of last year, the respective rates being 12.24 and 12.22, a difference of 0.2 in the weekly rate, equivalent to an increase of only 2 deaths. The mortality of the contagious diseases, other than infantile paralysis, was lower during the past week than during the corresponding week last year. There was an appreciable decrease in the mortality from pulmonary tuberculosis, which, however, was to some extent offset by an increase in the deaths reported from the other tuberculosis diseases. The mortality of the degenerative diseases was heavier during the past week than during the week ending June 26, 1915. The inclement weather last week resulted in an increase in the number of deaths from bronchitis.

The death rate for the first 26 weeks of 1916 was 14.82, as compared with 15.10 for the first half of 1915.

In response to a call issued by Commissioner Emerson, a conference of experts was held at the Health Department on June 28 to discuss plans for the control of infantile paralysis in Brooklyn. With 23 new cases reported June 28, the total in Brooklyn during the present outbreak, has already amounted to 206 cases. At the conference it was decided to organize a special field force in Brooklyn under Dr. Simon Blatteis of the Department's Bureau of Preventable Diseases. Assisting Dr. Blatteis will be a special staff of medical inspectors, sanitary inspectors, nurses, and sanitary police, who will visit all cases daily and see that strict quarantine is maintained. Hereafter all the premises where a case of infantile paralysis exists will be placarded. The Department of Health has prepared a special pavilion at its Kingston Avenue Hospital where sufferers from infantile paralysis will be cared for by skilled specialists. The Department is organizing a special visiting staff of experts, including specialists in children's diseases, orthopedists and neurologists, who will assist the regular attending staff in caring for the little patients. Wherever complete isolation and proper nursing cannot be maintained in the homes, patients ill with infantile paralysis will be removed to the Health



Department's special pavilion just mentioned. The Health Department insists that a patient, in order to be allowed to remain at home, should have a separate room, separate toilet, a special person in attendance for nursing purposes, and facilities for the proper disposal of all discharges. Where these facilities cannot be provided, the Health Department will remove the patient to its hospital, where these and many other special facilities will be provided free of charge and where the best obtainable medical talent will be in attendance. The Department calls attention to the importance of general cleanliness in all communicable diseases. In infantile paralysis, not only should there be the highest possible degree of cleanliness in the home, but careful attention should also be paid to the proper disposal of all discharges from the patient, both nasal and bowel. The Department will see that all the infected homes are supplied with effective means of disinfecting both the personal clothing and household effects, with a view to limiting the spread of infection to others. A special meeting of experts was also held at the Department of Health on Friday afternoon at 2.30, and on Saturday, July 1, at 2 p.m., a meeting of Brooklyn physicians, living in the area affected by the present epidemic, was held at the Polhemus Memorial Clinic under the joint auspices of the Department of Health and the special Poliomyelitis Committee. On July 1, 53 new cases and 12 deaths of poliomyelitis were reported in New York, making a total of 59 deaths since the outbreak of the epidemic.

**LONDON DEATH RATES IN APRIL.**—Statistics recently published show that the total death rate of London in April, 1916, was 17.2 per thousand inhabitants living. Among the several districts and boroughs, the highest rate was 25, in Shoreditch, a populous East Side shum, and the lowest was 12.3, in Hampstead, a more open suburb on the north.

**BRITISH HONORS FOR PHYSICIANS.**—The British birthday honors, recently announced, contain the names of several notable physicians. Dr. Christopher Addison, M.P., formerly lecturer in anatomy at the medical schools of Charing Cross and St. Bartholomew's Hospital, is appointed a privy counselor, and the honor of knighthood is conferred on Mr. Francis Mark Farmer, dental surgeon to the London Hospital, on Dr. Armand Marc Ruffer, president of the sanitary maritime and foreign council of Egypt, and on Dr. Nestor Tirard. Dr. Tirard is professor of the principles and practice of medicine in King's College, and senior physician to King's College Hospital and commandant of the Third London General Hospital. As secretary of the pharmaceutical committee of the general medical council, he has been for twenty years medical editor of the *British Pharmacopoeia*.

**MEDICAL SURVEY OF BRAZIL.**—The Rockefeller Foundation last winter sent to Brazil to make a general medical survey of the southern part of that country, an international health commission, consisting of Dr. Richard M. Pearce of the University of Pennsylvania, Dr. Bailey K. Ashford, U. S. A., and Dr. John A. Ferrell. This commission has recently returned to the United States after spending in Brazil a period of about four months, devoted to a study of the Brazilian general education system, medical schools, hospitals, dispensaries and public health organization.

#### EUROPEAN WAR NOTES.

**SURGICAL UNIT TO THE CENTRAL POWERS.**—The American Physicians' Expeditions Committee has recently sent from New York the sixth surgical unit which it has dispatched during the course of the war to the Central Powers. This unit consists of six physicians and six nurses under command of Dr. Joseph I. Eastman of Indianapolis, professor of surgery at the University of Indiana. This expedition sailed from New York for Rotterdam aboard the *S. S. Ryndam*. Its destination is Austria.

**THE SANITARY REHABILITATION OF EAST PRUSSIA.**—In the issue of the *British Medical Journal* for June 10, is published an editorial account of the recently issued report of Professor Kirehner in behalf of the commission of which he was a member, which was sent to East Prussia after the first Russian invasion and again after the second. This report describes particularly the effect of these invasions upon the country and the methods by which the sanitary rehabilitation of the province was effected.

On August 20, 1914, the population was notified that the province must be evacuated. Many thousands streamed away and were cared for by the war organizations. Between August 26 and 28, Hindenburg's victory temporarily eased the pressure of the Russian armies, and the civil medical administration was set the task of restoring order to the ravaged province. Professor Kirehner found the conditions less serious than he expected. Alarmist rumors had spread through the press to the effect that at the battle of Tannenberg thousands of Russians had perished in the Masurian lakes. It was feared that all the drowned men and horses would poison the province. But, as a matter of fact, the lakes are far from Tannenberg, and no foundation for these rumors could be discovered. On the whole, there was little disorganization from the sanitary point of view. The dead had been properly buried, and even on the battlefields there was little trace of the recent past. The wells were in good condition, and the land was again being plowed. The sum of 20,000 marks was provided for the care of infants and the tuberculous; temporary hospitals were run up in place of those that had



been destroyed; 200 beds, with bedding, were supplied in a few days by the Red Cross; and the requisite number of doctors and chemists was also provided. But in October fresh Russian forces swept over the border, and the province had again to be evacuated. This time the Russians stayed longer, and devastated the country more thoroughly. When Professor Kirehner and his Commission returned to the province after the second Russian retreat, the country was ruined. It was estimated that 300 million marks would be required to restore the 36,000 houses which had been burnt. Russian prisoners were employed by the thousand in gangs of thirty to forty for three months. Trenches were filled up, wells were cleaned, and hospitals and other most necessary buildings were restored. The graves of the fallen were also attended to. By July, 1915, some 75% of the inhabitants had returned, but for lack of housing accommodation a considerable degree of overcrowding was unavoidable."

**BRITISH MEDICAL CASUALTIES IN THE BATTLE OF JUTLAND.**—It is officially announced that in the great naval battle of Jutland on May 31 and June 1, a total of twenty-three medical officers were lost among the killed. These included the fleet surgeons of the *Queen Mary*, the *Invincible*, the *Indefatigable*, the *Defence* and the *Black Prince*.

**DIRECTORY OF WAR RELIEF FUNDS.**—In response to recent inquiry, we are publishing herewith a brief directory of the more important American relief funds for the European War, with the address to which in each instance money contributions should be sent:

AMERICAN AMBULANCE HOSPITAL. Mrs. E. D. Brandegee, 82 Devonshire St., Boston.  
 AMERICAN FUND FOR FRENCH WOUNDED. Kidder, Peabody & Co., 115 Devonshire St., Boston.  
 AMERICAN RED CROSS, MASSACHUSETTS BRANCH. Mr. F. L. Higginson, Jr., 44 State St., Boston.  
 ARMENIAN RELIEF FUND. Mr. Henry D. Forbes, National Shawmut Bank, Boston.  
 BELGIAN RELIEF FUND. Mr. J. H. O'Neill, Federal Trust Co., 85 Devonshire St., Boston.  
 BRITISH IMPERIAL RELIEF FUND. Mr. Charles H. McIntyre, 18 Tremont St., Boston.  
 CANADIAN RELIEF FUND. Mrs. Lydia G. Raymond, 500 Boylston St., Boston.  
 EAST PRUSSIAN RELIEF FUND. Mr. L. M. Bartels, 99 Nassau St., New York, N. Y.  
 FRENCH ORPHANAGE FUND. Mr. Allen Forbes, State Street Trust Co., Boston.  
 GERMAN RELIEF FUND. Dr. Rudolph Hertz, 32 India St., Boston.  
 ITALIAN RELIEF FUND. Mr. William R. Thayer, 301 Boylston St., Boston.  
 LAFAYETTE FUND. Old Colony Trust Co., Boston, Mass.  
 NATIONAL ALLIED RELIEF FUND. Lee, Higginson & Co., 44 State St., Boston.  
 PRINCE OF WALES RELIEF FUND. Mr. R. M. Stuart Wortley, 25 Broad St., New York, N. Y.  
 POLISH RELIEF FUND. Mr. W. P. Blake, 27 Kilby St., Boston.  
 RUSSIAN RELIEF FUND. Mrs. Curtis Guild, 121 Marlborough St., Boston.  
 SERBIAN DISTRESS FUND. 555 Boylston St., Boston.  
 ALLIES' TOBACCO FUND. Bartlett Brothers & Co., 60 State St., Boston.

BELGIAN SOLDIERS' TOBACCO FUND. Bartlett Brothers & Co., 60 State St., Boston.

**WAR RELIEF FUNDS.**—On July 1 the totals of the principal New England relief funds for the European War reached the following amounts:

Massachusetts Red Cross .....	\$146,390.67
Belgian Fund .....	129,491.33
French Wounded Fund .....	90,655.29
Army Huts Fund .....	59,715.60
French Orphanage Fund .....	56,705.83
Polish Fund .....	38,203.72
Surgical Dressings Fund .....	36,964.87
Facial Hospital Fund .....	22,925.55

#### MEXICAN NOTES.

**PREVENTION OF TYPHUS INFECTION IN MEXICO.**—Perhaps the most immediate and important problem in connection with the Mexican situation, is to prevent the introduction of typhus infection, which is more or less endemic in Mexico, not only among the United States troops, but into the country at large through Mexican refugees who are now crossing the frontier in large numbers. The United States Public Health Service has already taken measures to secure this end and rigorous examination of all such persons will be made at stations along the boundary. With reference to maritime travel, the following orders have been issued to officers on duty at all United States quarantine stations.

"The following provisions will apply to vessels from Mexico arriving at a port of the United States south of the southern boundary of Maryland during the close quarantine season:

"1. Vessels from Progreso, Tuxpam, or Frontera, that have discharged or loaded cargo at sea and have not been alongside a wharf, have had no crew ashore, and carry no passengers, may be passed without fumigation or detention of crew or vessel, provided all are well upon arrival and the above provisions have been certified to by an accredited medical officer of the United States.

"2. Vessels from all other Mexican ports, and those from Progreso, Tuxpam, or Frontera that have not complied with the foregoing requirements shall be treated according to the provisions of paragraph 105, Service Regulations.

"Vessels from Colombia, Venezuela, or any other port of South America or the West Indies suspected of being infected with yellow fever shall be treated according to paragraph 105, Service Regulations."

**RED CROSS ACTIVITIES.**—In conjunction with the mobilization of the National Guard and the imminence of impending war in Mexico, the American Red Cross and its branches have undertaken immediate activities to discharge their duties in the field. On June 19, the United States Military Relief Committee of the New York Red Cross, meeting in New York City,



completed arrangements for the immediate dispatch of four Red Cross hospital units to the Mexican border. These units are already organized and will have a capacity of caring for 2,000 patients. For the immediate financing of these units \$100,000 are needed, of which \$89,000 have already been raised. Volunteers are available for the immediate formation of two more units, if needed. Over 600 nurses are enrolled and available for service.

Report from Washington on May 21 states that the National Red Cross is prepared to equip field units sufficient to do hospital service for an army of 100,000 men and will soon increase its capacity so that it could care for 250,000. Its chief deficiency at present is in field equipment.

**SURGICAL SUPPLIES FOR MEXICO.**—The preparation of surgical supplies for use by the United States Army and National Guard in Mexico has been undertaken by the surgical dressings committee of the National Civics Federation. In addition to its headquarters at the Peter Bent Brigham Hospital, subsidiary work rooms will be established elsewhere throughout the country and invitations have been extended to women to volunteer for work in the preparation of supplies.

**DENTISTRY FOR MASSACHUSETTS NATIONAL GUARD.**—The importance of sound teeth in the general health and efficiency of the soldier has been abundantly demonstrated in the present European War. In observance of this lesson therefore, steps were immediately taken upon the mobilization of the Massachusetts National Guard to inspect the teeth of soldiers in the troops prior to their acceptance for active service. This work was voluntarily undertaken by the staff of the Forsyth Dental Infirmary, of the Tufts Dental School, and of the Dental Clinic of the Carney Hospital. During the early days of mobilization, soldiers were sent from the camp at Framingham to the Forsyth Infirmary for treatment, which consisted chiefly in extraction, filling, and cleaning. Later this work was continued at Framingham by a large number of dentists from the above institutions, who went to the camp and devoted entire days to the work, while the physicians of the medical corps were engaged in the physical examination of recruits, the re-examination of enlisted men prior to their acceptance for Federal service, and the administration of smallpox vaccination and anti-typhoid inoculation. As a result, the Massachusetts troops, whose departure for the front is already under way, will be sent into the field in creditable physical condition; and particular praise is due, not only to the regularly appointed medical officers, but to the dental surgeons who thus volunteered their services for the welfare of the Massachusetts troops and for the credit of the profession.

**CASE OF TYPHOID FEVER IN FRAMINGHAM.**—The vigilance of Massachusetts medical officers

is evident by the discovery and prompt quarantine of one case of typhoid fever among the troops assembled in camp at Framingham. Sixteen other patients with minor diseases were detained in the camp hospital.

**NEW HAMPSHIRE HOSPITAL CORPS.**—Report from Concord, N. H., states that on June 22, the Adjutant General of that state was authorized to organize a field hospital corps for the fifth division of the National Guard. This corps will be immediately recruited and will be located at Manchester, N. H. It will consist of sixty-seven men in command of the major, captain and other officers. The field hospital which this corps will maintain will consist of 216 beds.

**DEFICIENCIES OF THE MEDICAL SERVICE.**—The recent mobilization of the National Guard, though on the whole creditable throughout the country, has revealed deficiencies in the medical service as well as in other branches of the organization. One of these is the insufficient number of surgeons allowed to each regiment. On a war footing of 1600 men, each regiment has but four surgeons, who, under conditions of field service in war, are obviously insufficient. In all foreign countries the allowed ratio is seven surgeons to 1000 men.

Another great deficiency of the medical service is its lack of organized sanitary units. Many states in the Union have no field hospitals or ambulance companies. The entire organized militia of the United States, which has a strength on paper of 120,000, possesses only twenty-eight field hospitals and only eighteen ambulance companies, and these organizations muster 852 commissioned officers and 4000 enlisted men. The states which are entirely lacking in these essential units are Alabama, Arizona, Arkansas, Delaware, Florida, Georgia, Kansas, Mississippi, Montana, New Mexico, North Dakota, Oregon, Utah, and West Virginia. At camps of instruction for sanitary bodies recently held under the auspices of the United States Army, 8000 officers and men from the entire country were in attendance. Of these, 304 were from Pennsylvania and 292 were from Massachusetts.

#### BOSTON AND NEW ENGLAND.

**THE WEEK'S DEATH RATE IN BOSTON.**—During the week ending July 1, 1916, there were 214 deaths reported, with a rate of 14.68 per 1,000 population, as compared with 158 and a rate of 11.01 for the corresponding week of last year. There were 37 deaths under 1 year, as compared with 18 last year, and 62 deaths over 60 years of age, against 49 last year.

During the week the number of cases of principal reportable diseases were: diphtheria, 41; scarlet fever, 21; measles, 226; whooping cough, 24; typhoid fever, 7; tuberculosis, 66.

Included in the above were the following



cases of non-residents: diphtheria, 7; scarlet fever, 1; measles, 2; tuberculosis, 4.

Total deaths from these diseases were: diphtheria, 4; scarlet fever, 1; measles, 4; typhoid fever, 1; tuberculosis, 17.

Included in the above were the following deaths of non-residents: diphtheria, 2; scarlet fever, 1; tuberculosis, 2.

### Massachusetts Medical Society.

ESSEX NORTH DISTRICT SOCIETY.—At the annual meeting of Essex North District Medical Society, on May 5, 1916, it was voted that the "Society instruct its councilors to urge the council of the Massachusetts Medical Society to use every legitimate means to procure an amendment to the Workmen's Compensation Act which will give the insured freedom of choice of medical attendance."

J. FORREST BURNHAM, *Secretary*.

99 Bradford St., Lawrence, Mass.

### Miscellany.

#### THE PAY CONSULTATION CLINIC AT THE MASSACHUSETTS GENERAL HOSPITAL.

Two reasons led to the establishment of the Pay Consultation Clinic which was opened at the Massachusetts General Hospital on January 25, 1916.

One was the desire to make the facilities and staff of a large general hospital available to the practitioner in his care of patients of moderate means. The other was to enable this group of patients to obtain the benefits of a complete range of skilled advice and expensive equipment, at a fee within their reach.

It is intended that both the family physician and his patient shall be benefited. If not accompanied by the doctor, the patient is required to bring a letter from him, which is a guarantee that the person to be admitted belongs in the group for which this clinic is intended. Experience with the eight hundred patients so far received, shows that the family physician is making legitimate use of the opportunity. Two or three patients outside of those "of moderate means" have been noted, but it is expected that even this small number will be reduced by the consideration of the doctor who asks for a diagnosis and advice.

After a sufficient number of visits have been made for the clinic physician to establish a diagnosis, a letter is sent to the family doctor summing up the opinions of the consultants, together with the evidence given by the X-Ray Department and laboratories.

The treatment that seems advisable to the consultant is suggested to the patient's physician. The patient is not treated, and after the diagnosis is made, he does not return except at the request of the family doctor.

Many cases have required the combined investigation of several specialists. The neurologist and roentgenologist are needed to reinforce the opinion of the internist, or the ophthalmologist and neurologist confirm the diagnosis of the surgeon in a cerebral case.

Each of the New England states has contributed its interesting and difficult cases to the total of over eight hundred patients, so far seen in the clinic. Instances of the value of combined opinions are easily given. A case of severe anemia required the combined observation, each from his own angle, of the physician, surgeon, roentgenologist, and technician to locate the cause as a bleeding ulcer of the rectum which had given no localizing or suggestive symptoms. Another example might be cited of a patient with indefinite signs, which were finally brought to a focus by the x-rays of the chest. In another case, the catheterizing of the ureters, with the bacteriological report and guinea-pig findings localized a final diagnosis as a tubercular right kidney.

The clinic seems to be a concrete expression of thoughts that have existed in the minds of some of the more progressive men in and outside of the profession of medicine.

Before the Consultation Clinic was established, the opinions of one hundred representative physicians and surgeons in and around Boston were ascertained regarding such a step. The sixty replies received endorsed the idea without exception.

Recently, fifty-nine replies have been received from letters sent to physicians who have sent cases to the clinic. One has considered it a failure; fifty-eight have found it of great help and expressed their appreciation of it, and ten of this number have made some minor suggestions by which the clinic could be made of still greater assistance to them.

ALGERNON COOLIDGE,

RICHARD C. CABOT,

DAVID L. EDSELL,

CHARLES L. SCUDDER,

CHARLES A. PORTER,

FREDERIC A. WASHBURN, *Secretary*.

*General Executive Committee.*

#### AMERICAN RED CROSS PREPARATIONS

COL. JEFFERSON R. KEAN, Medical Corps, U.S.A., as Director General of Military Relief for the American Red Cross, made the following statement on June 25:—

"The most important work which has probably ever been undertaken by the American Red



Cross for the assistance of the Medical Service of the army, is now being done in the organization of base hospital units from the personnel of the larger civil hospitals in this country. These base hospitals, which embrace much of the best professional talent in the country, are intended to be transported on the outbreak of war to the seat of military operations, where they are located at the city which is selected to be the military base. One of these is needed for each 20,000 men brought into service. They receive the sick and wounded coming from the field hospitals at the front, and in them the wounded soldier in his journey to the rear first finds a comfortable bed and trained nurses. Thirteen base hospitals with skilled personnel are now organized and seven more are in process of organization.

Each base hospital is equipped to receive 500 patients. Although organized by the Red Cross, they are not administered by it, but when called into active service, pass under the exclusive authority of the War Department and become a part of its medical service. The medical officers are given military commissions in the Reserve Corps, and receive volunteer commissions when called into active service. The nurses, in the same way, belong to the Red Cross nursing service, and in time of war become a part of the army nurse corps.

The organization in time of peace of these large and complex units will place at the disposal of the government immediately on the outbreak of war organizations which it would require many weeks to create and equip, and offers our soldiers from the first the finest medical talent in the country. The following are the locations of these hospitals and the heads of their various services:

*Presbyterian Hospital, New York City.*—Director and Chief of Surgical Service, Dr. George E. Brewer; Principal Assistant, Dr. Alfred Stillman; Chief of Medical Service, Dr. Warfield T. Longcope; Chief of Laboratory Service, Dr. Karl M. Vogel; Chief Nurse, Miss Anna C. Maxwell.

*Mount Sinai Hospital, New York City.*—Director, Dr. N. E. Brill; Chief of Surgical Service, Dr. Howard Lillenthal; Chief of Medical Service, Dr. R. Weil; Chief of Laboratory Service, Dr. George Bachr; Chief Nurse, Miss Elizabeth A. Greener.

*Bellerue Hospital, New York City.*—Director and Chief of Surgical Service, Dr. George David Stewart; Chief of Medical Service, Dr. Van Horne Norrie; Chief of Laboratory Service, Dr. Charles Norris; Chief Nurse, Miss Clara D. Noyes.

*New York Hospital, New York City.*—Director and Chief of Surgical Service, Dr. Charles L. Gibson; Chief of Medical Service, Dr. Lewis A. Conner; Chief of Laboratory Service, Dr. William J. Elser; Chief Nurse, Miss M. H. Jordan.

*New York Post-Graduate Hospital, New York City.*—Director, Dr. Samuel Lloyd; Chief

of Surgical Service, Dr. Edward W. Peterson; Chief of Medical Service, Dr. Arthur F. Chace; Chief of Laboratory Service, Dr. Ward J. MacNeal; Chief Nurse, Miss Amy Patmore.

*Brooklyn, N. Y. For Navy.*—Director and Chief of Surgical Service, Dr. W. B. Brinsmade; Chief of Medical Service, Dr. Luther F. Warren; Chief of Laboratory Service, Dr. Robert F. Barber; Chief Nurse, Miss Frances van Ingen.

*Massachusetts General Hospital, Boston, Mass.*—Director, Dr. Frederic A. Washburn; Chief of Surgical Service, Dr. George W. W. Brewster; Chief of Medical Service, Dr. Richard C. Cabot; Chief of Laboratory Service, Dr. J. Homer Wright; Chief Nurse, Miss Sara E. Parsons.

*Boston City Hospital, Boston, Mass.*—Director, Dr. J. J. Dowling; Chief of Surgical Service, Dr. Edward H. Nichols; Chief of Medical Service, Dr. John Jenks Thomas; Chief of Laboratory Service, Dr. Ariel W. George; Chief Nurse, Miss Emma M. Nichols.

*Harvard University, Boston, Mass.*—Director and Chief of Surgical Service, Dr. Harvey Cushing; Chief of Medical Service, Dr. Roger I. Lee; Chief of Laboratory Service, Dr. Richard P. Strong; Chief Nurse, Miss Carrie M. Hall.

*Lakeside Hospital, Cleveland, O.*—Director, Dr. George W. Crile; Chief of Surgical Service, Dr. W. E. Lower; Chief of Medical Service, Dr. C. F. Hoover; Chief of Laboratory Service, Dr. H. T. Karsner; Chief Nurse, Miss Grace Allison.

*Rochester, N. Y.*—Director, Dr. John M. Swan; Chief of Surgical Service, Dr. C. W. Hemmington; Chief of Medical Service, Dr. William V. Ewers; Chief of Laboratory Service, Dr. C. C. Sutter; Chief Nurse, Miss Emma Jones; Assistant, Miss Jessica Heal.

*Johns Hopkins Hospital, Baltimore, Md.*—Director, Dr. Winford Smith; Chief of Surgical Service, Dr. J. M. T. Finney; Chief of Medical Service, Dr. T. C. Janeway; Chief of Laboratory Service, Dr. T. R. Boggs; Chief Nurse, Miss Bessie E. Baker.

*Harbor Hospital, Detroit, Mich.*—Director, Dr. Angus McLean; Chief of Surgical Service, Dr. C. D. Brooks; Chief of Medical Service, Dr. B. R. Shurly; Chief of Laboratory Service, Dr. P. M. Hickey; Chief Nurse, Miss Emily McLaughlin.

The generosity of Mr. Irving T. Bush, of the Bush Terminal, Brooklyn, who for the past two years has given spacious warehouse room to the American Red Cross for the storing, boxing and shipping of European war relief supplies, has again been splendidly manifested, for he has relieved the embarrassment of the Red Cross in regard to space for storing the equipment of the five base hospitals now being organized in New York in behalf of our army and navy, by offering storage room for three of these units at the Bush Terminal. This large space is in addition to the storehouse which Mr. Bush has furnished the Red Cross as a depot for its European supplies.



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### Addresses.

#### CERTAIN OCCUPATIONS AS CONTRIBUTING FACTORS TO DISEASES OF THE SKIN.\*

BY CHARLES J. WHITE, M.D., BOSTON.

*Edward Wigglesworth Professor of Dermatology in Harvard University.*

WITH the rapid movement of the modern world toward social betterment, there has been initiated a most commendable desire to help the workingman in many ways. Increased wages, shorter hours, and healthier homes and working places have been obtained, and, in addition to these benefits, the authorities, with the aid of the medical profession, have undertaken a systematic investigation of the laborer's occupation, in an endeavor to discover and to eradicate, in so far as is possible, the noxious elements of his daily work.

The study and knowledge of occupational diseases are not new themes in what has been called law-abiding Germany, nor in conservative England, but in our easy-going, lenient United States, enthusiasm and zeal toward this wholly proper branch of social welfare have been awakened rather slowly, and it is only within two years or so that even the Massachusetts General Hospital, which we like to regard as a most progressive institution, has seen fit to establish a bureau devoted wholly to the study and recording of this branch of medico-social work.

\* Delivered at the Harvard Medical School, February 27, 1916.

It is not our intention to say that doctors have not known for a long time, more or less, about a few diseases associated with or caused by certain occupations, for this would be a misleading assertion, but it seems fair to state that any intensive study of this special division of knowledge is of comparatively recent origin in this country. There is an exception to this general rule, however, in favor of the skin specialists, who for many years have studied the causes of certain baffling diseases with the greatest detail, and have recorded in their special books and periodicals many interesting and important facts. But general medicine has not bothered over-much about the doings of dermatologists, and it may be that the world has been a loser thereby.

It is my wish, therefore, in the brief hour at my disposal, to tell you in so far as I may, what dermatologists have learned about the skin in its relation to man's work. This is not an easy task, I assure you, for the facts are many and the time is short; and one must avoid falling into the error of reading a mere catalogue, which might be useful to a student, but would form dry material for a public recital.

In treating this really large subject, we must be systematic and divide up the whole question into subdivisions, and I think some of you at least will be surprised at the number of headings we shall develop.

### DISEASES OF THE TROPICS.

In the first place let us speak of the man, be he soldier or sailor or engineer or explorer or



doctor, or what not, whose duty calls him to the tropics. Every year, more or less, we at the Massachusetts General Hospital have the unpleasant duty of discovering a leper, and in almost every instance the pitiable victim has hailed from the warm countries of the earth or else has visited them in his work. I need not dwell upon the details of this disease, for you know somewhat concerning it. It has been our lot also to recognize and to treat a man suffering from frambœsia, or yaws, a disease which was for a long time confused with syphilis and not without reason, but modern science has discovered that both diseases owe their origin to a protozoan called the spirocheta, one taking artificial stains very faintly and the other being considerably longer and relatively more delicate—I refer to the spirocheta pallida of syphilis and the spirocheta pertenuis of yaws. We have also been fortunate enough to identify an active example of the so-called "oriental sore"—a disease which is indigenous to the northern coast of Africa, the eastern shores of the Mediterranean, and the lands watered by the Indian Ocean. This affection has almost as many names as it has places of origin, but at present we know that this much be-titled malady is due to a minute animal belonging to the same group as the plasmodium of malaria. If you will look at many Armenians in Boston you will perceive on their faces a large depressed scar, and this is the stigma of a past infection of "oriental sore"; but the case I have referred to is the only one, I believe, which has been observed in Boston in its active stage. Elephantiasis, which signifies a huge enlargement of a limb, as a rule, is another disease which can be acquired in the warm countries. We have the disease here, you know, following repeated attacks of inflammation of the connective tissue of the skin, as, for example, erysipelas—but in the tropics the disease is acquired from the bite of a mosquito which harbors the embryo of a worm known as the filaria sanguinis. In addition to these diseases, man may acquire special forms of ringworm which flourish mightily in the heat and moisture of the tropics, so that his body may become completely covered with the plant. Or again, the human foot may become, from an infection closely related to the actinomyces fungus, the seat of a great swelling and abscess formation to such an extent that amputation becomes a blessing. This is called Madura foot, and falls to the lot of some who live or work in the Near East. And, finally, there is a peculiar wart-like growth found in the valleys of the Andes and known as the verruca Peruviana—a disease which Dr. Strong and his colleagues studied in their expedition of 1914.

#### DISEASES DUE TO ABNORMAL TEMPERATURES AND ATMOSPHERES IN THE TEMPERATE ZONES.

In the second place we shall speak of diseases produced in the temperate zones by abnormal

conditions of heat, or cold, or moisture, or dryness.

*High Temperatures.* The stationary fireman, who constantly opens his furnace door to throw in coal may acquire a permanently red condition of his lower legs due to the frequent blasts of hot air which flash against his skin. The baker who opens his hot oven door to insert his loaves is apt to suffer from a distressing eczema of the arms. The foundryman who handles his molten metal is liable to severe burns from splashing drops or from sparks which fly when the cooling metal is hammered, and the blacksmith may suffer a similar injury. We all know of the many forms of accidental explosions to which the members of our fire department are liable. These are some of the examples of diseases due to heat.

*Low Temperatures.* On the other hand, we are familiar with the chilblains and frostbites which fall to the lot of those whose vocations expose them to severe or to continued cold. These are the chauffeurs, cabmen, policemen, freight crews, soldiers, sailors, cold storage men, quarriers, ice handlers, ice cream makers, soda fountain attendants, and many others. One of the striking hardships of the soldiers of the present war has been their lot of standing for hours, and even days, in the half frozen waters of the trenches. A curious cause of chilblains came to my notice the other day in the case of a young girl whose duty it was to pack chocolates day in and day out in a room unheated in winter and artificially chilled in summer, and through long hours this girl removed chocolates from a cold moving belt, upon which a blast of cold air was directed from above. The resulting cutaneous disability was not to be wondered at.

The humidity or the dryness of the surrounding atmosphere plays an important rôle in certain occupations. A laundress, stooping for hours over her washtubs in hot, dog-day weather, may find her face red and to a greater or smaller extent dotted with sage-like grains. This condition, which we term hydrocystoma, is due to the plugging of the mouths of the sweat ducts of the skin, and in the moist heat the perspiration, becoming excessive and not being able to reach the surface, backs up and forms chambers of fluid. As you know, certain processes in the manufacture of sugar must be conducted in superheated rooms, and in some men, subjected to this heat and moisture, boils are very apt to develop.

*Excessive Dryness.* The dryness of the atmosphere exercises an even greater part in the susceptibility of, or, perhaps more accurately stated, the sensitization of men's skin to the noxious elements of their labor. Perspiration contains a good deal of fat and in normal amounts means much more to our comfort than most of us realize. In our New England autumn and winter the air is very dry but craves moisture, and without our knowledge or



consent steals what it can from our skins. You know the result,—our hands and wrists and ankles chaf and crack and our skins prickle and tingle and we are uncomfortable. This dryness and consequent fissuring of the integument mean the breaking down of man's chief defense against the ever-present surrounding bacteria and the irritating substances of his existence, and often constitute the determining factor of disease or health; and in consequence we who see and treat many diseases of the skin dread the advent of fall and winter, for we know how difficult it becomes to treat our patients under these adverse and rather unconquerable circumstances. One of the things I would do if I had money would be to build a skin hospital, equipped with a large green-house, and in this favorable, warm, moist atmosphere I believe I could cure, or at least alleviate, some of the cutaneous ills of winter. As will be seen, therefore, most of us have to contend with atmospheric dryness for a certain part of the year, but the men whose paths lie in the far north, or the men whose lives are spent among high mountains, must endure these conditions the year round. You who have read the exciting tales of Arctic travel will recall the fact that these hardy travellers find it absolutely necessary to anoint the skin of their faces to preserve it from destruction. At this point it may not be out of place to refer to the similar drying effects of alkaline water, which the herdsmen and civil engineers and railroad construction men of our southwestern deserts have to endure. The African, the Indian, the Mexican can endure and withstand the desiccation of the desert wind and water because Nature has endowed them with greasy skins, but the Caucasian whose lot is cast in these climes is not to be envied.

**Increased Air Pressure.** High air pressure exerts its influence on the human skin as it does on other human organs, and we have noted in the victims of caisson disease a peculiar condition known as purpura. In other words, the men who are building our underground railways or are laying the foundations of our modern bridges and sky scrapers exhibit a tendency for the blood to be forced out of its normal channels into the surrounding tissues, thus leaving a temporary or permanent, indelible stain in the skin. This discoloration is blotchy and at first red, but on the lower legs of the older workmen this red tinge becomes a chocolate brown and remains as such indefinitely.

**Excessive Light.** You know that all light contains at least two distinct elements—the so-called heat rays and the so-called actinic rays. We have already described the effects of heat in speaking of the fireman, the baker, the foundryman, and, of course, there are other sufferers from this natural element; but now we want to refer to those who fall victims to what are called the chemical rays of light. You have all noted the peculiar skin of the hands, forearms

and especially the neck, of farmers and gardeners and trench diggers and fishermen and sailors—you have observed the brown color, the thickness, and in the case of the neck the deep creases and at times tortuous folds of the skin. These conditions are common, but in certain susceptible individuals the sun produces more important changes. The skin of the face, or the back of the hands, may become in places a still darker brown and rough and scaly—a condition which we call keratosis; and, as a further development, cancer may arise *de novo* or out of these localized keratoses. These changes are observed so often in seafaring men that the Germans have dubbed this stage "sailor's skin."

The most advanced illustration of this dermatitis actinica has been observed among the original x-ray workers, not the patients but the doctors and the manufacturers, and death has claimed many of these pioneers who have given up their lives in consequence of their unfortunate ignorance and zeal, while others are living today in delicate health, and crippled by the loss of one or many fingers, or even hands.

It is luckily well recognized today that the frequent worker with the x-ray must protect his skin well behind leaden screens if he would avoid the fate of his scientific predecessors. If he becomes careless, sooner or later he will perceive that his exposed skin is becoming reddened and then freckled, and that his hair is getting dry, and perhaps falling, and later that between the freckles the integument is growing white and thin and glazed and that little arborescent blood vessels are putting in an appearance. And later still, if this worker continues his unwise methods, he will observe rough, scaly, brown islands of skin, and in some weeks or months these isolated spots will grow hard and deep, and now he has developed cancer, often of a peculiarly malignant type. After this, ulcers form and scar tissue results, and then come the surgical operations—the ablations and amputations and deformities and disabilities, and you know the rest.

I have described in detail the blasting effects of unfiltered x-rays because I have witnessed every one of these cruel changes in quite a number of instances, but the same degenerations may result from the unwise use of radium or the Kromayer lamp, or from other unprotected forms of light. In regard to the ill effects observed in radium workers, it is interesting to note the conclusions just published by Dr. Ordway, until recently the head of our neighboring Huntington Hospital. This author and practised worker states that the chief objective changes in the skin consist of flattening of the characteristic ridges, thickening and scaling of the superficial layers, and even atrophy and intractable ulceration. Subjectively, the results are even more important and trying. Tenderness, throbbing pain and various other modifications of sensation are noted, and as in x-ray accidents, are curiously obstinate to control and



cure. Perhaps many of you have observed the strange figures sitting over our street railway tracks, helmeted and gloved, engaged in electric welding. Experience has taught these men what they must do to protect themselves. Strangely enough, there is a certain disease—fortunately one of our very rarest—where the victim is so susceptible to the actinic rays of the sun that all the various cutaneous degenerative gradations incident to repeated x-ray exposures are produced by mere existence in our everyday surroundings. We have observed at least seven of these miserable people in Boston—quite our share. The tendency naturally evinces itself in early life, and I remember one baby, taken out of doors for the first time in February, who became sunburned at once and then freckled and then developed the disease in all its hideousness. The actinic rays can produce another rare condition of the skin called hydroa aestivale, in which small water blisters form upon the ears and hands, and these peculiar individuals lead a handicapped existence, and may die in consequence of this strange idiosyncrasy.

#### DISEASES OF POSTURE.

The standing position, obligatory for so many of our wage-earners in trades and occupations, too numerous even to mention here, means, sooner or later, to a certain proportion of these men and women, varicose veins. I shall not speak of the pain and fatigue this common fault entails—that is not in my province today—but I must mention the ensuing deterioration of the neighboring skin and its consequent susceptibility to eczema and to bacterial infection—either of which misfortunes almost inevitably leads to the well-dreaded varicose ulcer—a condition which usually means weeks of incapacitation.

To the tuberculously inclined there is an added danger in the standing position, for young women of this type may acquire deep and painful nodes of the lower legs, which require, to effect a cure, months of the most favorable conditions of rest and hygiene, unless the patient is wise enough to submit at once to a surgical operation. This disease is known as erythema induratum.

There is one more disease of posture which should be mentioned before leaving this division of our subject. I refer to the calluses which tailors, cobblers and others acquire on parts of the body where there is constant pressure or where repeated blows fall.

#### VICTIMS OF INSECTS.

The occupations which expose men to the bites of insects are many, and the world is now cognizant of the fact that the bite of an insect may be a simple temporary incident or may carry in its train the germ of some fatal malady. Northern guides suffer most from mosquitoes, midges and black flies, and those of you

who have been attacked by swarms of these pests can appreciate what these men have to endure in their daily lives, in fact a peculiarly susceptible individual may die in consequence.

Gangs of laborers, huddled together in ill-kept shacks without bathing facilities and without means of frequent changes of body linen, may soon become infected with lice, bedbugs, fleas, or itch mites. All of these insects produce their characteristic bites or diseases entailing great discomfort or suffering and consequent diminution in the working capacity of their victims. Our northern lumbermen are perhaps the most frequent victims, but any group of men, women or children living under similar conditions may suffer the same consequences, and we must not forget to include here the teachers, the policemen, the hospital attendants, the nurses or the doctors who examine or treat these patients or their clothes, and not infrequently become infected.

Within the past decade or more a new disease has been discovered, due to the presence in the skin of the poisoned, dart-like hairs of the caterpillars of the brown-tail moth. These imported pests have necessitated a great increase in our forestry work, and many men employed in this capacity have been poisoned not only by the living insects but by their leafy nests, which harbor the noxious material. Still more recently Dr. Schamberg of Philadelphia has been able to prove that a type of red and itching skin, observed in millers, farmers, and packers, is due to the presence of a small mite called the pediculoides ventricosus in the flour and straw which these men handle, and to this disease Dr. Schamberg has given the name of grain-itch.

#### THE RÔLE OF CERTAIN VEGETABLE PARASITES.

There are several groups of parasites, higher in the vegetable kingdom than bacteria, which now deserve our attention. The commonest of these, the hyphomycetes, produce diseases known as ringworm and favus. All classes of children are liable to become infected with ringworm, and the children of eastern Europeans and northern Italians bring favus to this country and frequently escape the usually vigilant eyes of our health inspectors. Those who care for such children, nurses, teachers, parents, doctors, are often infected with these diseases. Children are not the only conveyers of these organisms, for our common domestic animals, the dogs, cats, mice, horses and cattle, harbor these plants and play an important part in their dissemination. Thus several large classes of men and women are affected—I refer to cat and dog fanciers, hostlers, coachmen, jockeys, farmers, cattlemen and veterinarians. As a rule, ringworm in the adult in this country is an unimportant malady, for it is easily detected and easily cured, but there is one exception, however, and that is in the case of the horse infection. The horse at times harbors a distinct variety of the plant, and un-



happy is the man who becomes infected with this type of the disease, for within a few days the hairy parts of the face begin to swell and in the course of a week or two become a swollen, distorted, painful mass of abscesses, from which pus literally drops in really large quantities. There is, curiously enough, a redeeming feature to this strange infection,—it is short lived. The plant seems to require for its sustenance a certain substance known as keratin and this food the hair of the beard supplies. The inflammation resulting from the presence of this type of the plant is so severe that the ensuing pus is so extraordinarily profuse that the hairs are actually floated away from their attachments in the skin and lost, and the plant dies from lack of nourishment. The result is a rapid and spontaneous relief from what at first looks like a terrible and destructive disease. In the end quiet is restored, the hair reappears and there are no scars to tell the tale.

There is another and rather indefinite group which affects men engaged in certain agricultural pursuits or who live in parts of the country where agriculture flourishes. I refer to the families known as actinomyces, blastomyces and sporothrix, and men who plant and garner grain and men who tend or slaughter cattle infected with these organisms fall victims to these usually serious maladies. Many of you, perchance, have heard of the disease actinomycosis or lumpy jaw. Here men and cattle develop multiple abscesses in the skin and underlying tissues and perhaps the internal organs, especially the lungs, become involved and the unfortunate victims die. It is the same with the other families, the blastomyces and sporothrix. Here again men are attacked, and so long as the organisms remain limited to the skin the patients can live. The blastomyces produce rather vegetative forms of skin eruption—the skin becomes ulcerated and the surface uneven, and pus develops and thick crusts form and there is a red-purple halo about the ulcer. This condition is extremely rare in Boston, although we have encountered two such cases; but it is not uncommon in Chicago and in the great Middle West drained by the Mississippi and Missouri river systems.

#### BACTERIAL DISEASES.

The bacterial diseases play a very large and important rôle in certain occupations.

Boils, as you know, are produced by a very common bacterium with a very long name, the staphylococcus, and boils fall to the lot of many a workman. The machinist whose skin and clothes are permeated with dirty oil is frequently affected. The skin of the sugar maker, whose particular sphere lies in the superheated rooms of the factory, becomes moistened and consequently softened and therefore an easy prey to the entrance of this pus-making organism, and this is the case with any workman who

spends his days in moist heat. The workers in aniline dyes, in mineral or metallic dust, in paraffin, in tar, and in chlorine gas are all liable to boils and are among the patients who consult us for this painful condition. Acute boils are painful but soon pass, but in some individuals, whose blood is not up to par, the disease becomes chronic and then life becomes trying and difficult and the ability to work becomes a question.

Tetanus or lockjaw at times falls to the lot of the man who digs much in country soil and to the carpenter or builder who may wound himself with rusty nails. The trench life of the present war has proved a fruitful source of infection to the soldier, and in the early days of the struggle many a poor man yielded up his life to this dread disease; but fortunately modern science has come to the aid of the present fighting man and to his peaceful brother and a special antitoxin, injected soon after the reception of a wound, means safety to the recipient.

Glanders, another often fatal disease, seems peculiarly associated with horses, and the man who tends them in any capacity is very liable to become infected whenever he comes in contact with such a diseased animal. There are so many varieties of livelihood gained by association with horses that this disease becomes an important occupational question.

Anthrax, or malignant pustule, a veritable scourge, lies in wait for the unfortunate victim whose occupation obliges him to handle the skins of animals. This seems to be peculiarly true of the hides and fleeces of our domestic animals and the freight handler, the wool sorter, or scourer or spinner, the tanner, the hair or bristle worker, the farmer and the butcher yield their annual quota to this dread disease. The spore of the germ of anthrax is most difficult to destroy, a fact which complicates the situation, and, in addition, no man has yet discovered an antidote to the poison. Curiously enough the greatest hope of cure lies in what in some other fields of human activity has fallen into obloquy—I mean watchful waiting. I shall never forget an experience of some ten years ago. I found in my hospital ward one morning a man in great pain. He sat propped up in bed and on his left breast was a large carbuncular looking mass the size of an orange. The center was black and crusted and surrounded by large, moist, bead-like, white pustules suggesting for all the world a giant brooch of hematite ringed by pearls. Beyond this the whole left chest and upper abdomen were swollen and hard and partly pink and partly blue—a most striking spectacle. The history was as follows: three morocco workers, to while away their lunch hour, made a ball of wet kid skin and passed it to one another. Within two or three days they fell ill and separated—one was treated at home and he died; one went to a hospital and the wound was laid open and he died; the third came to us and no knife touched him and he lived. This is not an



isolated instance, for we at the Massachusetts General Hospital have recognized that surgical interference in these cases usually means death.

Tuberculosis is, as you know, a frequent occupational disease. The good Samaritan, be he relative, nurse or doctor, who spends much time in caring for tuberculous individuals, frequently falls a victim to the disease. The surgeon, the pathologist, the anatomist, and at times the medical student, may become infected in the finger or hand while working upon tubercular tissue. The butcher and the cowman are frequently infected in their close association with cattle. In fact, you see, many vocations may lead, sooner or later, to this unhappy result.

#### ANIMAL PARASITES.

There is one disease to be mentioned somewhat apart from the ordinary bacterial diseases because we believe the cause of the affection to be nearer to the animal kingdom than to the vegetable. This disease is syphilis. Within a few years you have been taught that the innocent as well as the guilty fall a prey to this malady, which in its manifold and various ramifications engulfs many a poor victim. We physicians have been gradually learning that a large group of diseases of the heart and blood vessels, of the kidneys, of the liver, of the spleen, of the brain and of the spinal cord are in truth due to an early infection of the syphilitic virus. This is comparatively new knowledge, for up to within a few years we limited, more or less, the ravages of the disease to the skin, the bones, the teeth, the eyes and the ears, and suspected somewhat the brain. Perhaps some of you are wondering why this affection is included among the occupational diseases. It is because those who surely deserve a better fate not infrequently acquire the disease in the discharge of their professional duty,—I mean doctors and dentists and nurses and wet nurses, and it seems a still stranger irony of fate that these men and women above all others should be hit the hardest. At least two of my former doctor patients are now dead of this disease. In addition to this medical group of victims, the glass blowers, who take turns in using the blowing instruments, are once in a while infected by a fellow workman.

#### DISEASES OF OBSCURE ANIMAL ORIGIN.

We have heard a great deal, especially in the last two years, of foot and mouth disease among animals. We have read in the papers of the many cattle and hogs which have become infected and been ruthlessly slaughtered. We have noted with regret the loss of whole herds of prize dairy cattle belonging to people, and especially to women who had made individual pets of these valuable animals. We all regret this senseless loss of animal life and wealth, but seemingly at present it can't be helped be-

cause foot and mouth disease is perhaps the most contagious of all diseases among animals. Here again you may be puzzled at the inclusion of this disease in this lecture. Here and there in affected districts men who have dealt with the diseased animals have developed a peculiar malady in which their bodies and the inside of their mouths are covered with great water blisters which come and come, and sooner or later the man dies mysteriously. This disease, ultra rare when associated with epidemics of foot and mouth plague, but more commonly observed among butchers (especially in England), who have not come in contact with this specific affection, has been observed and commented on once at the Massachusetts General Hospital by Dr. Bowen. Dermatologists the world over have hunted for the cause of this human infection. They have found in more than one instance a so-called diplococcus and again a peculiar bacillus, but as yet the medical world is unconvinced as to the precise organism at fault.

Once in a while in the warmer months of the year the dermatologist notes at the hospital, or more rarely at his office, a peculiar redness and puffiness of a finger or of a hand, which resembles erysipelas but is not accompanied by the systemic disturbance usually associated with that disease—I mean there is no fever, no headache, no loss of appetite and no nausea. This strange condition resembles also what is known as a septic hand, but this well-known infectious process is associated with the presence of some of the common pus organisms, while the rarer disease now under discussion does not seem to harbor any bacteria. This abnormal condition is termed erysipeloid, and we encounter it in the hands of men who have come in contact with animal matter, in short, we meet it in fishermen, in lobstermen, in crabbers, in butchers, and in poultry handlers. Dr. Gilchrist of Baltimore has made a careful investigation of the subject as observed in nearly three hundred instances in the crabbers of Chesapeake Bay, and has come to the conclusion that the disease is not a bacterial infection, but rather a poisoning by certain putrefactive products of the animal caught, killed or dressed—in other words, a localized ptomaine poisoning.

#### PLANT POISONING.

There are a good many plants, some of them very common, which cause trouble to the human skin. The list is rather a long one, containing some sixty or seventy individuals, and includes poison ivy, poison oak, and poison dogwood or sumac, several varieties of primroses, the nettle plant, the vanilla bean, the cashew nut, cowhage, smartweed, balm of Gilead, rue and certain lilies, and in fact when an individual has once become sensitized to plant poison an inflammatory reaction often results from contact with any plant with a sticky juice. Perhaps many of you in this audience have experienced



the redness, swelling, and blistering associated with this distressing and at times temporarily crippling disease. It is, therefore unnecessary for me to refer to the rôle this condition may play in the lives of farmers, woodsmen, rural or suburban laborers and builders, nurserymen, and sellers of plants and flowers. It does not seem, therefore, out of place in this connection to sound once more a word of warning about the poisonous primroses. There used to be two kinds sold by our florists—the *primula obconica* and the *primula sinensis*. The former still deserves our attention because of the frequency of its victims. This plant was formerly easily identified by its large, dark green, spade-shaped leaf with its back covered with whitish, hairy spines; by its long slender, spine-covered stem; and by its cluster of small, lavender blossoms, six to eight in number. Nowadays identification has become difficult because florists have transformed the size and color of the leaf, the length of the stem and the size and color and number of the flowers; but the poisonous element has, unfortunately, not been eliminated. The law should forbid the future cultivation of this Chinese immigrant, but at present the rule adopted by the florists seems to be this: if the seller is not poisoned he continues to sell the plant; if the seller is susceptible to its venom he will no longer handle it and his customers are spared.

#### CHEMICAL IRRITATION.

We come now to the most important part, perhaps, of our theme, that is the great and frequent influence which chemical substances exert upon the men, women and children who, to earn a livelihood, are obliged to handle them. The number of cutaneous reactions produced is very numerous and too technical to describe: the list of chemicals capable of creating these damaging changes is too long even to enumerate, and the trades most often affected number between eighty and ninety to my own knowledge. The question then arises as to how this serious, almost everyday condition can be brought to your attention without wearying you by its very unwieldiness. I must, however, run this risk and take my chances with your patience.

The maker of acetylene gas may suffer from burns and ulcers due to the caustic lime in the calcium carbide.

The handler of denatured alcohol, and this means a large group of artisans, may suffer from eczema owing to the pyridine contained in methyl alcohol.

The aniline dye worker is liable to sweating of the hands, to redness, swelling and blisters of the skin, and to eczema as well, especially if he uses chlorinated lime to remove the traces of his day's work. Some years ago there was observed at the Massachusetts General Hospital, among members of the Boston Fire Department, a series of cases of skin poisoning which was easily laid at the door of a new issue of

shirts dyed with aniline black. Blaschko, a German dermatologist, has recorded similar results after contact with fifteen different aniline colors.

The handler of arsenic, be he the producer, the furrier, the taxidermist, the leather worker, the sprayer of trees, or what not, may suffer from redness and dryness and consequent itching, from pigmentation, from "shingles," from ulcers, from coriification and from cancer.

The artist at times may owe his eczema to the turpentine and various pigments associated with his profession.

The baker has to contend with the possible presence in the flour of the grain mite, with the irritation of moist dough and of saccharin solutions, and with the great heat of his oven, and is a man who frequently consults us because of his eczema. Other handlers of flour,—the miller, the grocer, and the cook, should also be mentioned in this connection.

The barber is subjected to many forms of irritation, for his hands are used on all sorts of people, rubbing in various soaps with hot and cold water, and applying all manner of patented hair tonics. Eczema, therefore, is not an infrequent disturber of this man's peace, and sooner or later may oblige him to abandon his calling altogether.

The bar tender frequently consults us because of his eczema produced by the constant submersion of his hands in cold and dirty water and in multitudinous alcoholic slops. Then, too, the brass, which must glitter in his establishment, requires frequent polishing, and this duty only adds fuel to the flames.

The bleachers and cleaners are peculiarly prone to eczema, for benzine, chloride of lime, various acids and gasoline all remove the natural fats from the skin and dry skins are always unfortunately susceptible to disease.

The borax workers may become eczematized, and this is true of the producers, of scrubbing men and women and of laundresses.

Bricklayers and masons have an occupation which subjects them to the constant use of water, lime, cement and mortar in hot and in cold weather and causes them to fall victims to a most obstinate type of eczema.

Brushmakers must scour the bristles with strong alkalis, and cutaneous irritation follows in a certain proportion of those engaged in this work.

Bronze workers are prone to eczema and to boils on account of their intimate contact with the dust of copper, with hydrochloric acid, with antimony sulphide and with benzine.

Calico printers handle many dyeing, mordanting, bleaching and cauterizing elements, and their potassium and sodium chromates, chalk and stannic and acetic acids are notoriously eczematizing.

The candy maker is a very frequent victim of eczema, for the hot sugar which enters so largely into this occupation is a determined irritant of the skin. To an even greater extent does choco-



late exert its pernicious influence on this group of sufferers, and the so-called chocolate dipper is a very frequent visitor to our skin clinics.

Canners owe their frequent attacks of eczema to the preservatives of the foods and to the ingredients used in sealing the tins.

Cabinet and piano makers, carpenters and in fact all wood workers, frequently ask us to cure their facial and manual eczemas. The resinous dust from many of the tropical woods, such as mahogany, rosewood, ebony, teak, satin and cococus; the variety of rhms, which enters into the elements of the Chinese and Japanese lacquers, and the pyridin, shellac, and methyl alcohol of their varnishes, form a large group of especially irritating substances.

Makers and handlers of drugs and chemicals suffer much and frequently from their occupation. Eczema, boils, acne, gangrene, ulcers, cancers and other diseases owe their origin to prolonged and frequent contact with such substances as arsenic, calcium chloride, cantharides, carbolic acid, the caustic alkalis and acids, chlorine, bichromate of potash, formalin, iodoform, mercury, opium, and tar. In this class are to be included the doctors, dentists, medical students, nurses, hospital attendants, and undertakers, whose vocations require the frequent use of bichloride of mercury and formalin.

Chimney sweeps suffer from a peculiar type of cancer engendered by the tarry products of the soot which permeate their clothes and bodies.

Cloth handlers may become eczematized by irritating wool fibers and by the various dyes which color them.

Cooks, scullery maids, dishwashers, housemaids, laundresses, house cleaners, in fact all domestic servants, are peculiarly prone to eczema of the hands and arms, for their work is wet and dirty and washing soda and other chemicals are employed frequently to lighten their labors, but often the result is disastrous. The dishwashers frequently present a peculiar infection about the nails called paronychia, and until recently the orthodox Jewish women suffered especially because their religion, which fears pork in any form, forbade the use of soaps, the fats of which might contaminate their eating utensils. Now, fortunately, Kosher soap has solved the problem and we see much less of Yiddish paronychia.

Coopers employ caustic soda to wash their barrels, and this chemical, plus the ensuing solution of the paints, sooner or later causes eczema in the susceptible.

Electroplaters, who employ lime in the cleaning of their metals, cyanide of potash, sulphate of nickel, and chlorine in a nascent state in their plating, and sour beer in their "scratch brushing"; silver polishers, who, in their work, depend on a rouge consisting of mercury, iron and wax and upon cyanide of potash and bichromate of potash, and, in their finishing, employ a mixture of lime dust and olive oil; enamelers,

who work constantly with various metals; and jewelers, whose work is somewhat similar to the others of this group, all follow trades which sooner or later may produce irritation of the skin.

Electric workers, who, day in and day out, subject their skins to lead, copper, brass, paraffin and various acids, fall a prey to these irritating substances.

Flax spinners suffer peculiarly from ulcers due to the constant handling of thread soaked in very hot water containing lactic and butyric acids.

Fruit preservers owe their frequent attacks of eczema to the irritating fruit acids and sugars and to the constant immersion of their hands in hot and cold water.

Furriers pay the penalties of their occupation more often than do most of their fellow workers. I have already spoken of the serious dangers of arsenic, and, in addition, these artisans may be affected by lime and by various dyes. It is not at all an infrequent occurrence for me to treat the victims of fur poisoning and the peculiar reddening and burning and itching and swelling of the skin at times are well nigh unbearable.

Galvanizers employ benzine, Vienna chalk and soap lye and dip their hands in the galvanizing baths and the results are frequently, temporarily at least, disabling.

Glass workers come in contact with copper sulphate and with hydrofluoric acid, and eczema often supervenes. The cementer of stained glass prepares and uses a substance composed of many eczematizing elements. This cement is compounded of ammonia, asphaltum, boiled oil, Portland cement, turpentine and whiting. What a list of offenders! It is no wonder that such a worker told me the other day that sooner or later, one by one, the men engaged in this particular division of the manufacture of stained glass had to be transferred to another branch of the work.

Gold refiners are irritated by cyanide of potash, and gilders are liable to a peculiar effect from turpentine which inflames their nostrils and gums and at times produces painful blisters and ulcers.

Hair dyers lead a life decidedly open to severe cutaneous irritation. The nitrate of silver and mercury and walnut juice of the older dyes and the paraphenylenediamin of the newer stains play havoc with susceptible skins, especially when they are moist, and the men and women who devote their lives to this sort of work must be really picked individuals, for not many weeks ever go by in my office without encountering some of the victims of hair dyes.

Hat makers suffer considerably from eczema, for fulminate of mercury, sulphuric acid, dirty water and the hair of animals are all irritating substances.

Men who handle hay, men who work with straw, men who use rushes of various sorts, may



suffer from unusual infections resulting from possible contaminating moulds.

Ice cream makers and soda fountain employees suffer from the effects of cold, as I have mentioned earlier this afternoon, but contact with irritating fruit acids adds its share to the hazards of these forms of employment.

Lacquer work is notoriously irritating. The poisonous oil obtained from the Chinese and Japanese rhus sooner or later may give rise to eczema, swelling, fever, catarrh of the eyes and nose or a popular outbreak on the arms and legs.

Laundry men and women are subject to continuous exposure to hot and cold water, strong soaps, soda, chlorine and many cleansing fluids, any one of which is capable of causing mischief to those with susceptible skins.

Leather workers, and this term comprises the makers of many articles of trade and commerce, and includes, of course, the tanners, have been mentioned before as possible victims of malignant pustule, but they may fall a prey also to the effects of arsenic, hydrochloric acid, lime, bichromate of potash and of the dye aurantia in which they work.

Linoleum, which in its various forms is coming more and more into vogue, requires crude naphtha in its manufacture, and this substance causes trouble to some of its users.

Lithographers, who make use of formalin in their "sheet printing," ask our help from time to time on account of eczema.

Masons and plasterers pay their toll to heat and cold as already mentioned, but they have to contend also with the eczematising character of the tools of their trade—the rough handles of their hammers, trowels and hods, made more irritating by the cutting edges of particles of granite and other hard stones. Then, too, their hands in winter are in cold water and in cement and lime and sand and hair, and the effects are often disastrous, as can be easily imagined.

Match makers deal with phosphorus and chromic acid and the sesquisulphide of sulphur, and these substances are very hard on those who handle them.

Machinists of all sorts have a common enemy in dirty oil, which is rubbed into and absorbed by the follicles of the skin, and if boils don't follow, eczema may. The necessary cleaning at the end of the day's work adds its quota to the harm to which these men's skins are subjected.

Metal workers, miners and smelters form another large class whose occupations subject them to many forms of irritation. Lead, mercury, copper, brass, bronze, antimony and arsenic are only a few of the more common minerals which produce various types of skin disease, but the concomitant dust, filings, acids, turpentine, etc., all form still further irritating adjuncts to these brands of human activity.

Mother-of-pearl, owing to its very fine, hard and gritty dust, produces a good deal of eczema.

Musicians, curiously enough, are subject to certain skin diseases. The persistent piano

player at times produces calluses on his fingers; the violinist, cellist and harpist and zither player follow his example; and the player of wind instruments may develop pressure symptoms on his lips. It was my ill fortune to observe recently a cancer on the lip of a saxophone player from this very cause, and this regrettable and serious condition represents, naturally, the extreme and fortunately rare limit of mischief which this constant daily pressure can produce.

Painters lead a really hazardous life. We are not concerned this afternoon with the evils of lead poisoning, but we must speak of the many cutaneous irritants of the painter's trade. In their white-washing their hands are soaked in water and lime and frequently irritated by the dirty accumulations of years which they remove from the walls. In their painting their skins come in contact with many poisonous mineral coloring matters, with grease and oils, and with turpentine, shellac, varnish and methyl alcohol. In the cleaning of painted walls and shellacked floors the modern patented fluids are full of potash and irritating oils. This makes a truly formidable list of enemies for any one group of men to withstand.

Paper hangers are subject to the irritating aniline dyes of their papers and to the harmful effects of the glues of their pastes. Fortunately for these men arsenic has been practically eliminated from their wares.

Paraffin workers seem to be peculiarly prone to skin diseases. The substance harbors, as you know, many provoking ingredients, mostly mineral oils, and constant contact with this medium, with the consequent impregnation of the clothes, may produce eczema, pustules, and in the end cutaneous cancer.

Paste, as just mentioned, contains glue, and consequently its makers and handlers may suffer from eczema.

Photography is a profession which supplies many a victim to the class of skin diseases we are now considering at such length. Metol, a comparatively recent developer, is a most common malefactor and bichromate of potash and of ammonium and pyrogallie acid are not much behind in their mischief-making qualities.

Physicians, and let us include here all those who handle and care for the sick, lead a decidedly hazardous existence. I have alluded before to the various forms of bacterial and animal life which beset the paths of medical men and women, but now we are concerned with chemical forms of cutaneous irritation. The constant washing of the hands, often with so harsh a substance as green soap, and the necessary use of chemicals, such as bichloride of mercury, tincture of iodine, alcohol, carbolic acid and especially formalin, lead to constant recurrence of eczema to such an extent that some of these victims are obliged to abandon a profession the preparation for which has cost years of time and hundreds and even thousands of dollars.

Porcelain makers have much to do with tur-



pentine, and you have noted this afternoon, perhaps, how often this substance enters into the various arts and have appreciated also its baleful influence on the human skin.

Printers engage in a trade notoriously trying to the skin. The lead of the type impregnates itself into the skin, and, owing to the danger of leaving this poison undisturbed, the man must clean his hands thoroughly before every meal. This process requires strong applications. Then, too, the preparation and subsequent cleaning of the type demands the use at one time or another of lye, oils, benzine, turpentine, acids and strong soaps—all mischievous articles with which we have now become familiar.

Stone cutters, be they the producers of the raw blocks at the quarries, the stone masons who help erect our buildings, or the sculptors who fashion our statues, suffer from the heavy work of their trade in their resultant calluses, from the sharp, cutting particles of stone which penetrate and subsequently poison the skin, and from the extremely irritating work of stone polishing.

Rubber workers, in one or more of the various steps in the manufacture of the raw material or of the many finished products, fall victims to eczema. The use of naphtha in all processes is most common, and the finisher uses a compound of benzine, shellac and ammonia,—a combination which drives many a patient to a skin doctor.

The miners of salt may suffer from ulcers, while men who handle salt, such as picklers, curers of fish and sausages, and ice cream makers, are liable to a peculiarly painful type of eczema.

The maker of shoes is a frequent sufferer from eczema due to the handling of leather (often very dirty), naphtha, soap and the chemical shoe polishes.

Sugar as a skin irritant has been implicated before in our reference to candy makers, but the manufacturer of the pure article suffers much from eczema, impetigo contagiosa, boils, lymphangitis, and sore finger nails. These various diseases owe their appearance to the possible presence of the sugar mite, to the inherent qualities of molasses and sugar, and to the great heat which is apparently necessary in certain steps of the making.

Tar handlers in the many and various phases of the term are peculiarly liable to skin diseases. Tar is used at times by physicians for its good effects in certain specific conditions, but this same substance is capable of great harm when brought in contact with the skin over too long periods of time. Pustules and acne are the first danger signals, and then come warts, various thickenings of the horny layer of the integument and finally cancers. We have noted this possible contingency before in speaking of chimney sweeps and paraffin handlers.

Tobacco workers come to our notice quite

often suffering from eczema of the fingers and hands. The tobacco leaf in itself is in all probability irritating to the susceptible skin, but in the process of manufacture certain caustics and the waters of fermentation add their quota of mischief to the original irritant.

This, then, closes my long résumé of the subject, and, looking back over these many subdivisions of the question, we may note that 46 or more diseases have been mentioned, apportioned among approximately 120 different occupations. This is rather a discomfiting disclosure to us perhaps, especially when we stop to consider that the past hour has been devoted only to diseases of the skin. However, we cannot dodge the truth of the foregoing remarks, for they are well recognized by men who have studied the matter conscientiously, and I personally have observed all but one of the diseases and have treated in all probability representatives of a very large proportion of the many occupations.

Let us not assume, however, that these diseases fall to the lot of all men and women who engage in these multifarious pursuits. That would be absurd; for if that were the case many of us here now would be at home nursing a damaged or diseased skin.

What, then, is the truth? There are no available statistics covering the whole subject of occupational skin diseases, but in the case of eczema we have more or less reliable figures. Knowles of Philadelphia reckons that one quarter of the cases of eczema which he treats are directly attributable to the occupation of the patient; Hazen of Washington computes the percentage at one-fifth, and Oppenheim, a German writer, makes the figures four-eighteenths; all three observers, you will perceive, in substantial agreement.

Granting, therefore, that a certain proportion of the community is susceptible to the dangers inherent in its chosen occupation, cannot anything be done to mitigate or possibly to abolish these dangers? My answer is a strong affirmative. How, then, can this highly desirable result be obtained? Mainly through the education of the employer and the employed. I for one do not believe that the average employer of labor is a brute and a tyrant, because, in the first place, in these days of keen competition it is not for his interest in any way to have his men incapacitated. One great object in the present intensive study of occupational diseases is to teach the employer in every possible way how to safeguard the health of those in his employ, and this purpose is slowly but surely being evolved. On the other hand, the splendid modern science of preventive medicine is gaining fresh impetus every day, and the results from the employer's point of view are already bearing fruit. We physicians, who spend our lives among contagious and often dangerous diseases, are fortunately usually spared from sharing the fate of our patients, mainly by our



knowledge of self-protection, and this same knowledge must be disseminated among all classes of our fellow-beings. That is what I mean, therefore, when I speak of a campaign of education; this is my purpose in appearing before you this afternoon; and this is the object the Harvard Medical School has in view in conducting over these several past years these series of free popular lectures.

### LEONARDO DA VINCI'S SCIENTIFIC RESEARCH, WITH PARTICULAR REFERENCE TO HIS INVESTIGATIONS OF THE VASCULAR SYSTEM.\*

BY ARNOLD C. KLEES, M.D., WASHINGTON, D. C.

(Concluded from page 7.)

With such an equipment, differing not essentially from our own, it is natural that Leonardo's findings had to be in advance of his time. For him "the heart is a muscle, the first in strength and the most potential among the other muscles." The ventricular as well as the auricular walls have transversal, longitudinal and oblique muscle fibres. He distinguishes the base and apex as we do, is aware that the base with fibrous, cartilaginous, osseous elements (the latter in animals) forms the more solid part of the structure, with which the more mobile elements, muscle fibres and valves are connected. He distinguishes the two ventricles and the two auricles, and he notes with precision their different shapes and the thickness of their walls. The septum is thinnest at the base and thickest at the apex. His conception of the septum, that part which has exerted probably the most important obstacle to a correct understanding of the cardiac function, naturally incites one's greatest curiosity, and it must be said that in the great number of representations Leonardo gives of it in various aspects, it does not appear materially different from what we know it to be. This is astonishing because in two or three places he speaks unmistakably about the penetrability of the septum in the Galenic sense, he names it the "cholatorio" of the blood, *i.e.* a colander, a strainer, but nowhere, not even in his schematic sketches, where one would especially expect it, does he show openings between the two ventricles.\* The question arises: what represents Leonardo's state of knowledge about this matter, his drawings or his words? A careful student of the manuscripts will be struck to find some expressions which could not possibly represent Leonardo's view, and still they stand there without any commentary. And then one will find else-

where the opposite view expressed, sometimes with direct reference to his own observations, the object of which may be further illuminated by a sketch. This gives one the impression that those improbable versions Leonardo perhaps put down on paper as a tentative proposition, a working hypothesis for further reference, and verification, and possibly derived from his book study. There are many other memoranda, the true nature and purposes of which are self-evident and therefore the supposition in this case may be allowed, *viz.*, that Leonardo, although he observed the solidity of the septum in the organs before him, noted down references to the literature. This reminds one somewhat of Vesalius' statement in the first edition (1543) of the *Fabrica* on this same subject, where he says that, although he did not find the holes, he, nevertheless, had to admire the Creator's skill which allowed the blood to sweat from the right into the left ventricle "through openings escaping the eye" (*meatus visum fugentes*). Sir Michael Foster, as you perhaps remember, considers this reservation as an ironical sneer, in no way an expression of doubt as to the solidity of the septum, but in view of the lengthy explanation which Vesalius gives of the same subject in the second edition twelve years later, his former statement may well be taken as an expression of uncertainty. Servetus' statement (1553) made between the two years, much more positive, may well have influenced him. As regards Leonardo, I may add that in one of his observations, undoubtedly his own here, he notes that he had found in one adult an opening (*foramen ovale*) in the auricular septum, and to be on the look-out for similar occurrences in other autopsies.

Leonardo's pictures of the external aspects of the heart are the best of his representations of organs: they might be compared with some modern ones, but with nothing from earlier periods. They have been criticized as not representing correctly the objects and also showing false relationship with adjoining organs (lungs, trachea). Both groups of objections are based on the presumption that Leonardo depicted human hearts, while it is clear that, particularly for the representation of the external features, he used bovine hearts and that he drew them perfectly correctly. As regards the correlation *in situ* it is true that there are several drawings which are evidently reconstructions by means of several drawings, which were derived partly from human, partly from animal objects. So in the much-admired large picture of a female situs, which must be considered as a most brilliant attempt at transparent anatomy, Leonardo draws the aortic arch situated in front of the left bronchus and below the bifurcation of the trachea, and from it issuing one large artery instead of three,\* all conditions found in bovines. It is clear that such a transposition of animal

\* In some sketches of sections through the septum, there appear on one side fine dots or short lines, but they do not reach to the other side. In the drawing of one square piece of the septum which shows on the upper and only visible side the unevenness of the surface, there appear on the cross-section several longer fine lines which, however, do not penetrate either (see *Quaderni II, fol. 3 recto*).

\* Elsewhere (*Foglietti B, 23 recto*) Leonardo shows the conditions as found in man, probably after he had had occasion to compare his earlier findings with those exhibited in a human autopsy.



anatomy into what purports to demonstrate human conditions is most misleading to the student, but in Leonardo's case it does not discredit the soundness of his actual knowledge any more than that of Vesalius' for drawing into his human figures the scaleni and recti muscles borrowed from dog anatomy. Leonardo did not intend his pictures for didactic purposes, and it is certainly more important to note that he drew correctly the junction of the vena azygos with the vena cava superior, also that of the venae spermaticae, the origin of both right and left arteriae sperm. int., and the relation of the ramifications of the hepatic blood vessels in the hilus of the liver to those of the hepatic veins in the liver itself, all conditions unknown in Leonardo's time (Holl, Quad. I, p. 80). Very lucid is his representation of the coronary vessels—"vessels which nourish the heart"—; he clearly distinguishes arteries from veins, they are uncovered except by a membrane ("pannicolo" *sc.* visceral pericardium). The artery lies deeper than the vein in general. In one view (Quad. II, 4 recto 9) one sees the origin of the two coronary arteries, their branches to the left and right of the pulmonary artery, the descending one of the right coronary artery running along the border of the right ventricle, this method of representation resembling much that employed in Henle's angiology (Fig. 1). In another view (Quad. II, 4 recto 3) we can follow the posterior vein of the left ventricle, the branches of the vena cordis media, the end of the vena cordis magna and its junction as coronary sinus with the inferior vena cava (Holl, Quad. II, p. 251). The whole coronary system is thus very well studied (Fig. 3).

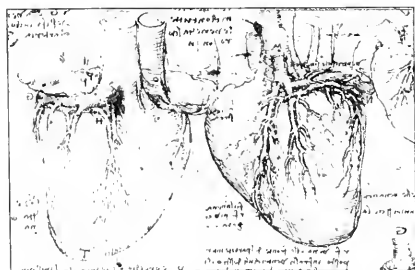


FIG. 3.—One of Leonardo's many studies of the coronary vessels. Arteries are clearly distinguished from veins (A. cr. sup., V. cor. magn. and media), (from Quad. II, fol. 41).

The great vessels, both those issuing from or entering into the heart, on the whole, are well to be distinguished in these external views, in some they are left as short stumps, in others the aorta or pulmonary artery are cut off just above the valves. The absence of a marked conus arteriosus and of distinct auricular sinuses, which appear only as smaller dilated ends of the venae cavae or as auricular pouches at the entrance of

the pulmonary veins, is rather striking, but corresponds to the conditions found in bovines (Fig. 1). Not very clearly given is the entrance of the pulmonary veins into the heart (Fig. 4).

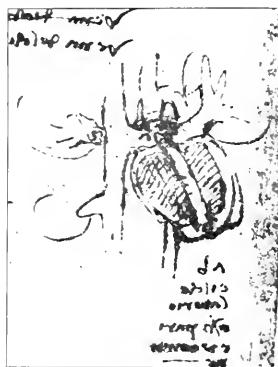


FIG. 4. Apparently the only sketch of L. II, which he indicates course and relation of pulm. veins together with those of VV. cavae. Note also "cholutorio" of septum, (from Quad. II, fol. 25.)

In one view they appear as a common trunk descending into the left ventricle with an auricular pouch, in another as two large vessels joining just before their entrance into the heart (Quad. II, 3 verso). But there cannot be any doubt about Leonardo's solid knowledge of all the parts of the heart, only as he examines them always with a view to their function, it is somewhat difficult to analyze them in the purely descriptive manner which modern anatomic research demands. Especially when it comes to an examination of Leonardo's conception of the valvular apparatus is it necessary to proceed in his own manner. Let us, therefore, see how he distinguishes the two sides of the heart. "The left\* ventricle has two orifices, one in the vena aorta, opening from within outwards, the other orifice is in the arteria venalis and goes from the heart to the lung, and has a single coat and is named arteria because of the thin (sottile) blood, and venal because of the simple vein (single coat)." On the same page we find the description of the right side, thus referring to his drawing: "—the gate of the lung (porta del polmone) and it is named vena arterialis; it is named vena, because it conveys the blood to the lung, and arterialis because it has two coats; and it has three valves (tre porte), which open from inside outward, with perfect tightness (perfecto serramento), and these are in the right ventricle, a the gate of the vena cava (vena chilj)." If we substitute for the Galenic terms, *i.e.* "arteria venalis and vena arterialis" our modern ones "pulmonary vein and artery": for "vena aorta" and "vena chilj," respectively aorta and

\* Leonardo writes here "right" evidently by mistake for "left", because in the same sentence he speaks of the aorta as issuing here (quad. II, 2 verso).



vena cava, remembering always that "vena" stood for "blood vessel" generally, while "arteria" signified literally then, as it does today, "air-tube," we have in the above a description corresponding to actual conditions. Leonardo also proceeds to a very painstaking examination of the valvular apparatus, to which he devotes several pages, one inscribed "Geography of the heart" (Quad. II, fol. 8 verso). Here again is strikingly apparent his mastery as a preparator and draughtsman. His examination embraces a careful scrutiny of all the component parts of the valves, separated, put together and *in situ*. One has the distinct impression that nothing escapes him and that he notes everything, and in passing I may call attention to one interesting discovery of his which was rediscovered only in our times. I mean certain muscle bundles or bands which traverse the ventricle from the ventricular wall to the septum, now usually described as "moderator bands" (Fig. 5). Leonardo was evidently much interested in these structures, as he draws them frequently in various aspects, and also in concordance with modern views he sees their function in the preven-

tion of ventricular overdistention,\* also interesting because of the great physiological and clinical significance only recently ascribed to the auriculo-ventricular bundles of His, which send branches into these bands of Leonardo's.\* To return to the valvular apparatus proper, it is obviously impossible to do justice to Leonardo's representation of them without going to very great lengths, and especially without an inspection of his many drawings. Most interesting and instructive is his preparation and demonstration of the tricuspid (Quad. II, fol. 3 recto and 8 verso). He dissects the whole valve from the underlying muscle, so that it appears unrolled in one plane or projection similar to that first employed in cosmographic projection by Mercator in 1550 (Fig. 6). We distinguish, issuing from the *columnae carnae* the papillary muscles, their *chordae tendinae* with their attachments to the cusps. The parts adjoining the septum and walls of the ventricle are indicated so that their position *in situ* is clear. "Join them together again," he notes with this drawing, "in the way they stand when the right ventricle shuts itself and then you will see the true shape of the valves how they do with their chordae when they shut themselves." And this is again illustrated in most original manner. In one picture we see the closed valve from the side of the ventricle, in the other from the atrium (Fig. 7). The mitral valve is studied in the same thorough manner as are also the semilunar valves as already alluded to above. The manner in which the aortic valve is shut engages Leonardo in various drawings. He studies the blood stream entering the aorta, the vortices which

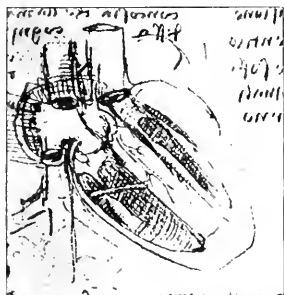


FIG. 5.—One of many sketches showing the transverse muscle band. Note also indication of different thickness of ventricular walls. (from Quad. II, fol. 14r.)

\* "Li muscoli ramificanti . . . servono a non lasciare dilatare il core più che il dovere." (Quad. II, p. 12, fol. 4 verso V); in another note he speaks of them as "catena", i.e. brake (Quad. IV, p. 13). It must be noted here that these bands are much more distinct and also longer in bovines than in man, where they sometimes do not even exist as isolated bands. Helli, who has lately called attention to this discovery of Leonardo's, proposes to have these structures named after Leonardo, a good suggestion seconded by Sudhoff. (Quad. II, 8 verso, Figs. 1, 2, 3; 10 recto and elsewhere, also Quad. IV, p. 13.)

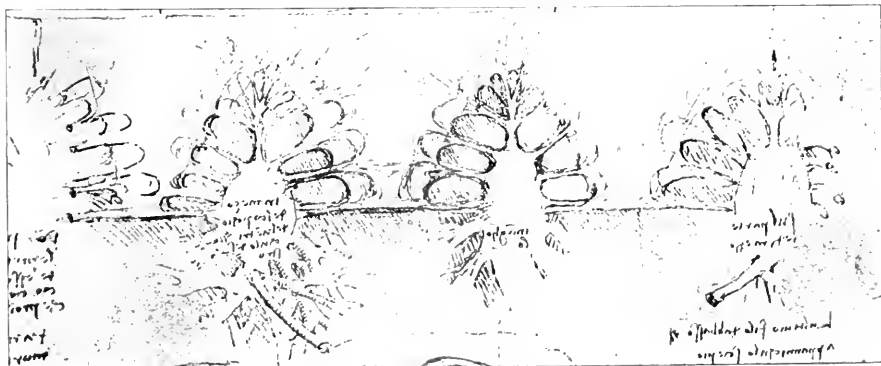


FIG. 6.—"Geography of the heart." Incisions on the pap. muscles, from left to right. "Modell. di r. ventricular wall, center, midwall." Note band which stretches from tricuspid, carn. on left to septum on right; also excellent representation of insertion of chord. tend. to cusps. (from Quad. II, fol. 8v.)



form beyond the valve and in the sinus Valsalvæ, distending and adapting the segments of the valve. To get a clearer picture of the valve he makes a cast of it in wax (Fig. 2, see page 61; he also seems to have used, or at least projected, a model of this region, a tube with a dilated portion so arranged that he could observe through a glass

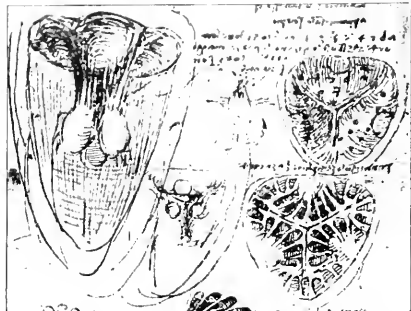


FIG. 2. Description reads: "Simple valve without chordæ valve seen from inside." (from Quad. II, fol. 8v.)

window the behavior of a fluid in motion. By these means he demonstrates how the shock of the vortices, as well as that of the whole blood column in the aorta upon the closure of the valve, have to be borne, not solely by the valvular segments, but also by the adjoining parts of the ventricle and the walls of the aorta in the sinus Valsalvæ, thus preventing rupture.

The function of the heart as a propulsing motor for the blood is also very fully gone into. Horizontal cross sections through the heart, as well as longitudinal ones, are drawn (Quad. II, 4 verso, and Rav. Moll. Mss. G. 1 verso) during systole and diastole. From these drawings and accompanying notes it is evident that he understood perfectly the rôle of the ventricular systole and diastole; moreover, he was equally well aware that the auricular systole was not synchronous with the ventricular one (Quad. f. 4 v.) but that they alternated. On the other hand, he knew the synchronism of the ventricular systole, of the heart beat against the chest wall, of the entrance of the blood into the auricle and that of the arterial pulse beat; also that the sound produced by the shutting of the valve is transmitted through all the arteries to the periphery, and sometimes can be perceived in the ear. He attempts to fix the rhythm of the heart contractions; "after the systole follows the diastole in two-thirds of a harmonic (musical) tempo" (Quad. II, 11 recto, IV), and in measuring the velocity of the blood current—a modern physiological problem—he realizes that it is inversely proportional to the calibre of the vessels.

Before I attempt to sum up Leonardo's concepts about the blood current in general it is necessary to survey briefly some of his findings

in the lungs and in the general vascular system. Leonardo, here as elsewhere, proceeds by objective investigation and experiment, a fact which must be borne in mind when considering this survey, which is apodictic for brevity's sake only. The lung, the form and divisions of which he describes in detail, is an elastic organ, which adapts itself exactly (Quad. IV, 3 recto) to the chest walls and the diaphragm.\* It expands in every direction but more downwards "because more useful for the expulsion of food from the stomach." "The freshness of the air, entering the lung is taken up by the arteries, which are in continuous contact with the ramifications of the bronchi throughout the lung" (Quad. II, 11 recto), he gives a very interesting sketch, showing the relation of blood vessels and bronchi (Quad. II, fol. 1 verso). Near this picture are the following words: "To me it seems impossible that any air can penetrate into the heart through the bronchi,"† and he proceeds: "... the bronchi (trachea) ramify, dividing into minutest branches, together with the minutest ramifications of the blood vessels (vene), which accompany them in closest contact to the end." And then he asks himself, after having above excluded the possibility of the air entering the heart from the trachea and from its ramifications, whether "here the air enclosed in this (the terminal bronchi) blows ('spiri') through the fine branches, entering into the smallest branches of those veins." The final result of this highly interesting inquiry we do not know. He speaks of terminal bulgings of the bronchi, which Hüll seems inclined to consider as a primitive conception of the alveoli, but the important thing is that the lung as a respiratory organ is correctly conceived by Leonardo as a distinct anatomic unit, the bronchial tree with its blind ending branches in closest contact with the blood vessels (Fig. 8). We see that he places the interrogation mark at the very point where only some new technical device (microscope) can give the answer. As regards the general vascular system his drawings show, as elsewhere, excellent dissection of the objects, faithful rendering in drawing and a good conception of the relations between the blood vessels and the various organs. So we find his representation of the portal venous system in good accord with conditions found.‡ Excellent knowledge betokens his picture of the arterial and venous ramifications in the liver and those of the hepatic duct, which he represents issuing from the hilus and connected with the cystic duct from the gall-bladder.

The question now naturally occurs: What did

\* S. a. Quad. II, fol. 1, recto, paragraph 6, where he speaks of inspiration of the lung: "and never does it burst, as it never fills itself entirely with the air," plain words for an important physiologic concept.

† "Trachea" in the text, but the sense is evident. To be noted is particularly the lacking distinction here made between air-conveying and blood-carrying vessels, although in the same paragraph he says clearly: "The lung cannot send air into the heart," giving his reason why it is not necessary that it should.

‡ Except for one short venous trunk from Vena cava inferior as junction point for the portal vein and the vena lienalis (Hüll).



Leonardo know of the circulation of the blood as this phenomenon now stands in our conceptions? By students of Leonardo's manuscripts it has been variously answered. Holl, the most eminent and painstaking among them, holds the conservative point of view, believing that the material in hand does not allow a definite statement; that Leonardo was, however, on the right

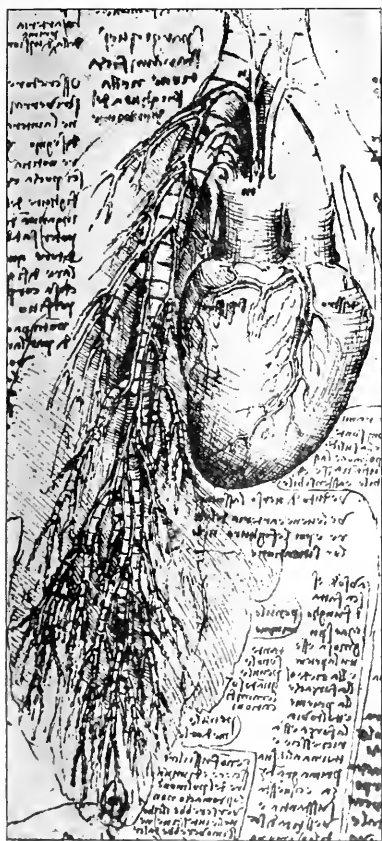


FIG. 8. Most interesting representation (schematic but not phantastic) of the bronchial tree with blood-vessels. Note the circumscribed area in lowest part of lung. L. describes it as an irregular locus of debris; "Nature avoids the breaking of the tracheal ramifications" (from quad. II, fol. 1r.)

road. Boruttan, Roth and others, judging mainly from Leonardo's text, believe that he had not even a primitive notion of the subject and similarly opinions undulate between excessive affirmation and complete negation. It seems to me that it is *au fond* entirely irrelevant whether Leonardo thought on this subject as we do or not. In this matter, as in so many, we forget that the concept of the circulation of the blood is not a final, eternal one, but simply the best working hypothesis, at the present mo-

ment, for our purposes as we understand them, and which again are not immutable in larger human experience. But while we have no other measure than our concepts of today for those of yesterday, it is well to remember that Leonardo's definitive views on this subject are not before us for scrutiny. Fragmentary, unconnected (or at least not systematically connected) observations in a life's experience which in itself is fragmentary, as far as our knowledge of it is concerned. Take these sheets that we are analyzing to find Leonardo's final concepts and compare them to loose sheets torn out indiscriminately from the laboratory records of a modern worker, a Pasteur, a Koch, for instance. That illustrates the difficulties in store for us. But with all these difficulties we can see enough of Leonardo's method of procedure and the stages of his knowledge to realize that he was far ahead of anyone at his time, but that by it and through it he had to come essentially to conclusions very similar, if not identical, to ours. Two errors of his time stood in Leonardo's way toward a conception of the circulation,—the penetrability of the septum and the conveyance of air through the arterial system. The conclusion drawn was that the right heart conveyed the blood to the organs it nourished, receiving it back again by the same route it had taken, while the left heart, receiving the vital principle from the lungs and partly through the septum from the right heart, distributed it to the brain and all the other parts of the body by means of the arteries. Now let us take the essence of this teaching which had reached Leonardo from Aristotle, through the Alexandrians and Galen and their numerous commentators. The heart is the central organ of propulsion, from it the blood is actively thrown into all the parts of the body which it nourishes and these same parts are vivified by something conveyed to them by the arteries. (For the present it does not matter whether the blood originates in the liver, or the heart or elsewhere). As a working hypothesis this conception is quite acceptable, and the one thing that troubles us most is that "vital principle," for with it arise in our memories those different kinds of spirits, natural, vital and animal, which we like to convey into a museum of ancient superstitions or of mediaeval demonology. But did not our great Harvey say: "*neque sanguis sine spiritu sanguis est, sed acquirova et cruor*," just as a stony, dead hand is not really a hand; so "*ne sanguis sine spiritu vitalis sanguis* (Letter to Riolanus, 1619, p. 117). and did he not also frequently allude to its astral relation, as, for instance, in: "*spiritus nempe et ual ara in a spiritu respondens elementa stellarum*. And still we are all agreed that Harvey did discover the circulation. But Harvey came with his discovery one hundred years after Leonardo was dead, and for him the *spiritus in sanguine* might be conceded to be a *façon de parler* for our oxygen. Let us go back a little to the genial discoverer of the lesser circulation—



which, as you remember, Huxley does not grant to be a circulation any more than he would apply that term to a walk from his door to that of his neighbors—to Servetus, who puts it: "*Primum spiritus ergo est sanguis.*" You see the shifting of terms: the *sanguineus spiritus* here to the "spirituous blood" of Harvey. We can follow this same concept through all the historical competitors for Harvey's place,—Vesalius, Realdo Colombo, Cesalpino, Ruini, Sarpi and the vast mediaeval and Renaissance literature, a reminiscence from Alexandria, which produced that troublesome concept of the "*pneuma*," that "aeriform fluid" conveyor of sensation and nourishment that no one, including Galen, well understood, but nevertheless commented, dilated and "improved" upon, thereby eluding the more rational concept of the great Aristotle. The intellectual visions produced were the air-filled arteries, which every barber in Alexandria and elsewhere knew to spurt blood on incision, but which none-the-less held their sway in untroubled spiritual airiness throughout successive learned books copied from each other. It must be presumed that in those times, as in ours, there were sober men who read between the lines as well as on them, and who compared reality with literature, knowing the truth even if they had not the means to express it, or perhaps because they had not. A man, extremely proficient in hydraulics, theoretically as well as practically, Leonardo who wrote (Rav. Mss. II. 101 verso): "The water which from the extreme profundity of the sea rises through the strength of its motor to the heights of the mountain, finds there open veins, enters them, returning by the shortest way to the deeper sea '*ramificante vene*' again to rise. . . forwards and backwards. . . "*moto girando*"—could he really have completely ignored the course of the blood current in the body? It is on this point that we have from his hand no definite and sometimes contradictory information. We cannot entirely ignore his statements about the direct communication between the ventricles, neither his reference to the flow and ebb of the blood, but it is entirely permissible to consider such expressions not as conclusive, even if we do not find contrary views definitively stated. At any rate, wherever he mentions the flow and ebb motion of the blood both the ventricles and auricles are considered the motive force behind it (Quad. I, 7 recto) and although he nowhere describes the exact route by which the blood returns to the heart from the lungs after having described correctly the path it took from the heart into the finest ramifications of the pulmonary vein, it is significant that he asks the question: "Whether the vessels of the lungs do not send the blood back to the heart, when they contract to expulse the air?" Another sheet, one of the many lost, may have contained an answer which would have made clearer a further advance, such as his drawings,

considered by themselves, allow us to suppose that he must have reached. Being unable to assert with certitude what conclusion on this subject, as on others, Leonardo reached, it is, nevertheless, clear that he pursued methods of research essentially the same as ours. He did not publish these methods and conclusions in the conventional way, but we know that there were many other ways open by which he could reach his contemporaries. His teaching in his academy in Milan and the dissemination of his manuscripts, their frequent perusal by others, even during his lifetime, must have encountered receptive minds. So we study in him the silent, unheralded influence in the search after truth by the accident of the discovery of his manuscripts. His work and similar other influences fill the gaps in our historic perception, and I see herein their main significance, that by their realization we get a truer picture of the continuity of the evolution of scientific thought. And what makes the personality of Leonardo so interesting and sympathetic to us is not measurable by the close approximation of his anatomic and physiologic knowledge to ours, it lies much more in the identity of procedure in his scientific inquiry. He is much more like one of us than any of the brilliant row of scientific celebrities of past centuries whose prejudices we cannot understand. But, while identical as far as scientific procedure is concerned, I believe there are some elements in his wider aim, in his emancipation from too close specialization, where he might well teach us many things, the appreciation of which may well be left to each one of us, according to our individual lights.

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NOTE.—Most of Leonardo's anatomical and physiological legacy is contained in 1, 2, and 3 of the above editions. Of these, 1 and 2 duplicate the facsimiles in 3, providing them with translations; therefore, when 2 is once completed 3 will become obsolete, but not 1, 3 fact sometimes overlooked. The editions 4 and 5 contain but little anatomy, but rather physiology and physiological optics. There are, furthermore, four or five other facsimile editions of extant Leonardo Mss., but they contain hardly any anatomy.

The literature on Leonardo's anatomy has already reached considerable proportions. References to it are to be found under "da Vinci" in Vol. XX, second series, 1st degree of the Bibliothèque General Library, 1915. To Prof. Hoff's reviews of the *Quaderni*, which have appeared from 1911 to 1915 in the *Archiv für Anatomie*, etc., the author acknowledges his special indebtedness.



## Original Articles.

### HEMATOCELE OF THE TUNICA VAGINALIS, WITH THE REPORT OF AN UNUSUAL CASE.\*

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HEMATOCELE signifies, from its derivation, a blood tumor and may occur in various parts of the body, but in genito-urinary practice, it indicates a collection of blood in the cavity of the tunica vaginalis, or in some pathologic, intra-serotal cyst.

According to the causes which produce it, this condition may be acute or chronic, for each type has its own peculiar, etiologic factors. An acute hematocele may be followed by a chronic one, but is not always, while one of the chronic type may be so from the start, and not preceded by an acute manifestation.

Strictly speaking an hematocele should mean an effusion of blood in the cavity of a normal tunica vaginalis, and when this occurs in other sacs, hydrocele, spermatocele and the like, it should be described as a hydrocele with blood or a spermatocele with blood, but it is more convenient to apply the term hematocele to all intra-serotal sacs which contain blood.

Clinically, therefore, the subject is divided into the primary form, where the blood effusion takes place in a normal tunica vaginalis, and the secondary, where the blood is mixed with the contents of other and pathologic sacs. This latter form is relatively the most frequently seen, and it may be well to consider it first and to review the causes which produce it.

First in frequency of this variety is the effusion of blood in a hydrocele.

A greater or less collection of fluid having taken place in the cavity of the tunica vaginalis, a sac is formed, the walls of which are distended in varying degrees, according to the amount of fluid contents. A blow or fall upon this distended sac meets with the increased resistance of the fluid, a rupture of the blood vessels of the walls of the tunica vaginalis occurs, and a varying quantity of blood is poured out and is mixed with the hydrocele fluid.

As a rule, there is extensive ecchymosis of the skin of the scrotum which is gradually absorbed. If the quantity of blood which escapes into the hydrocele is small, as it usually is, there may be no great increase in its size, but it pursues its normal increase as more fluid is secreted from its walls and it is only when it is tapped that we discover the presence of blood. The fluid is then of a very dark-brown color, sometimes black, and no clots are present, the sac collapsing com-

pletely after removal of its contents. A case which well illustrates this is the following:

CASE 1. A man of 77 had a hydrocele of 20 years' duration, which I had tapped at intervals of four to six months for 10 years. As he had moved into a distant place in the country I did not see him for 18 months and the sac had filled to a large size. When it was tapped, instead of the normal yellow of the hydrocele fluid, there was present a thin fluid of a black color, which was easily recognized as caused by the presence of blood. Upon questioning him as to any injury he had received in that region he recalled that 14 months before he had been riding in his farm wagon over a rough field when it ran over a stump. He was thrown up and fell back with great violence upon a hard wooden seat. A great deal of pain at once resulted and the tissues of the scrotum were extensively ecchymosed and swollen. This was gradually absorbed and the circumstance had passed from his mind.

This case was interesting not only from the slight effect such a severe blow had upon the course of the hydrocele but also because it shows how little power of absorption is present in the endothelial lining of the tunica vaginalis.

The black color of the fluid showed that it had been present for a long time and thus corresponded to the history given by the patient. A further interesting fact was that no clots were present as the sac was completely emptied through a small cannula. Many similar cases have been seen by the writer, but in no case was there so long an interval between an injury and the tapping of a sac containing unabsorbed blood. Another and very common cause of these secondary hematoceles is an injury to the walls of the tunica vaginalis by a trocar used in tapping a hydrocele. A leakage takes place into the cavity and the sac refills until in forty-eight hours it may be as large as before tapping. As a rule, a moderate ecchymosis occurs in the skin and fullness and pain are complained of. If a large amount of blood has been rapidly poured into the sac, clotting occurs and the fibrin is gradually separated from the clot and attaches itself to the walls, which become thickened and firm. Thus we have developed a chronic hematocele which is firm, non-elastic and not translucent to light, resembling a solid growth. As the hydrocele fluid re-forms, a tumor results, partly fluid and partly solid, and after tapping the hydrocele the fluid escapes, leaving behind the solid masses of organized blood clots. Such cases require operative relief.

Another result which is more favorable but less common is the cure of a hydrocele by the development of an hematocele within its cavity. A careful search of the literature of the subject has failed to find cases reported where this has occurred, yet that it does happen may be seen by the following cases:

CASE 2. A man of 40 consulted the writer 15 years ago for the treatment of a small hydrocele which was secondary to tuberculosis of the testis

\* Read at a meeting of the Staff of Mt. Sinai Hospital, Oct. 23, 1915.



and epididymis. Removal of the testis on the opposite side had been done five years before for tubercular disease. As the size of the sac caused him some inconvenience it was tapped, but in four or five months refilled, when it was again tapped. On his third visit, six months later, he was similarly treated but with quite different results. Within a few hours the scrotum rapidly swelled, the skin became ecchymotic and the cavity of the tunica vaginalis was filled to extreme distention. Rest in bed with ice bags soon caused an amelioration of the symptoms, the swelling slowly disappeared and the hydrocele did not return as usual nor has it since, for this patient has reported for examination within a month.

CASE 3. A man of 32 had a hydrocele which had been tapped twice a year for seven years, and for the last three years by the writer. After each tapping the sac was thoroughly emptied and no symptoms were noted. At the last operation the fluid was removed as usual but within a few hours the sac began to refill, the skin was ecchymosed and at the end of 48 hours it was as large as before. Palliative treatment was used, ice bags and rest in bed for a day, and later support of the scrotum by a large jockey strap. The swelling slowly decreased and the hydrocele has not returned.

Another similar case will be cited later which illustrates this as well as another fact in the etiology of the disease.

Two other similar cases have been observed. The probable explanation is that the blood clot acts as a foreign body and produces an irritation of the walls of the sac which obliterates it. We thus produce by accident the same result as we do when we insert catgut into the hydrocele or inject into it carbolic acid or tincture of iodine.

Another cause for this disease is the capillary oozing from the walls of an over-distended sac after tapping, just as it happens in the bladders of old men when too large an amount of residual urine is removed by catheterization.

I desire to add to the etiology of this disease one more cause which has not been mentioned before by any one, unless it has been overlooked in my search of the literature of this subject, and that is syphilis.

Every physician is familiar with the results of the arterial changes which take place from this disease elsewhere in the body, for example, hemiplegia, paraplegia, aneurysm and the like. There can be no doubt that a similar condition of arterial degeneration exists at times in the arterial coats of the blood vessels of the tunica vaginalis which permits minute ruptures and the slow or rapid effusion of blood into a hydrocele sac.

Very clearly is this shown by the following case:

CASE 4. J. B., 51 years of age, had syphilis 20 years prior to the present happening. For some years he had a hydrocele which had been tapped several times, the last two or three times being by myself. Considering that it needed tapping and feeling a little uncomfortable, he came in one day and I examined it and found that it was moderately distended, and prepared to tap it as usual but he

remembered that he had some important business to attend to and decided to wait. Three days later he returned and a great change had occurred, for in place of an elastic tumor he had one of stony hardness, resembling in all particulars a solid growth, and had it been the first time I had examined it I should have so diagnosed it. The fluid was easily removed through a cannula and showed a mixture of blood and hydrocele fluid. There was some reaction and the sac refilled rapidly but this absorbed and the hydrocele has never returned, showing the possibility of a cure by the development of this complication.

In this case there was absolutely no history of a blow or injury of any kind. Four other cases, which space does not permit me to relate, have suggested equally strongly the etiologic importance of syphilis. It must be remembered that not alone in hydrocele sacs may blood be found but also in spermatoceles, which are usually not in the tunica vaginalis at all but outside of it, being developed from embryonic organs, the paradidymis or organ of Giralde and the hydatid of Morgagni. A blow upon this collection of fluid or a trocar wound may cause a hematocele.

CASE 5. A patient with a very large spermatocele was referred to me by Dr. Chenery, and upon tapping showed only the characteristic milky fluid. A second tapping six months later resulted in rapid refilling, so rapid that in 24 hours it was two-thirds of its original size and the serotal tissues were swollen and ecchymosed. This subsided gradually and the case has not been seen since.

Among the rare causes for both primary and secondary hematoceles are hemophilia and scurvy.

The occurrence of the primary form of an hematocele is not common because a blow upon the scrotum is much more apt to cause an effusion of blood into the serotal tissues forming a hematoma, than to produce a collection of blood in the relatively small space normally present between the walls of the tunica vaginalis. The following case shows very clearly, however, that it may happen, that it may reach an enormous size and that, by the pressure upon the tissues covering it, it may cause great danger to life when neglected.

CASE 6. A man, 51 years of age, married, by occupation a baker, consulted me on Nov. 22, 1912, regarding a large tumor on the right side of the scrotum. Two months before his visit he had fallen from his wagon, across one of the shafts, striking the right side of the scrotum with great force. Immediate swelling and pain resulted and after the acute symptoms subsided there was a gradual increase in size. At the time of his visit a tumor as large as an adult head apparently occupied the whole of the scrotum. The penis could not be seen, but on the left of the swelling was an opening where the skin was apparently folded in and at the bottom of this the glans penis could be felt. The tumor was tense, moderately fluctuant and not translucent, and there was no pain on pressure or impulse on cough-



ing. This condition is well shown in the accompanying illustration, taken after it had again refilled.



The sac was punctured by a trocar which was followed by the escape of a fairly thick fluid containing a large amount of blood of rather bright color. It came slowly through the cannula and it required an hour to empty the sac partly. More than three quarts (105 ounces) of fluid were removed and a large soft mass of blood clots still remained in the sac. Many small clots were present in the fluid withdrawn. Immediate operation was advised and accepted, but for business reasons it was put off from time to time until Jan. 7, 1913. Meantime the sac refilled until at the time of operation it was larger than at the first visit. Due to the tension upon the walls of the sac and the scrotal tissues a slough, the size of a hand, formed at the lowest portion of the swelling, from beneath which a thin, bloody discharge oozed. A slight elevation of temperature (100 F.) appeared and sepsis was evidently imminent and his color and appearance was that of a sick man. Because of his obesity (nearly 300 pounds), his poor color and bad heart action, he was a poor other subject, and spinal anesthesia was decided upon and applied. The operation was performed by Dr. Arthur P. Janes, Dr. E. W. Cushing, consultant.

An incision was made high up in the groin and continued over the sac around and including the slough. The cord was first dissected and the tumor mass below was gradually loosened from its attachments and removed without entering its cavity. A considerable portion of the redundant skin and subcutaneous tissue was also removed. The incision was partly closed by sutures, leaving a large space below for drainage. Primary union was not expected nor obtained and the convalescence was slow but ended in complete recovery.

The pathologic examination of the mass removed was made by Dr. Timothy Leary at the Tufts College Medical School and was as follows:

Specimen consists of tunica vaginalis distended to form an enormous thick-walled sac, 23 x 13 x 10 cm. Along one surface of the sac can be traced the sper-

matic cord. Lying at end of cord and but slightly elevated above surface is a rounded mass 3.5 cm. in diameter. Section here shows what appears to be testicular tissue extending to a depth of 2 cm. Vessels of surface are dilated and injected.

On laying open, wall of sac is seen to vary in thickness from 4 mm. at base to 1.5 cm. at top. Sac is filled with clot and a clear jelly-like material. Along inner edge of wall can be seen delicate gray-white strands of tissue running into clot.

The skin received with specimen measures 17 x 8 cm., is thick, coarse, hypertrophied. In the subcutaneous tissue are seen three rounded masses, one at either end of skin and one in center measuring (a) 5.5 cm., (b) 4.5 cm., and (c) 2.5 cm. in diameter. On section, *a* and *c* consists of rather soft, red-brown tissue, *b* consists of a thick-walled sac filled with edematous gray-white tissue.

Mx. shows in wall a marked increase in fibrous connective tissue with a heavy infiltration with lymphoid cells. In places occur masses of old clot undergoing organization. The wall shows occasional small abscesses. The contents of sac consists of clot with masses of pus in places undergoing organization. Mx. through skin nodules show merely a chronic inflammatory picture.

*Diagnosis.*—Chronic and acute inflammatory.

The unusual features of this case are the rapid formation of an hematocoele containing more than three quarts of fluid, the rapid refilling of the sac, and the great danger from septic infection from the patient's neglect to have the operation done promptly.

The important point to the clinician in the pathology of this disease is the effect upon the testis when a large amount of blood rapidly escapes into the cavity of the tunica vaginalis and fills it with clots. The fibrin is separated and adheres to the walls in layers and the cavity itself is filled with a gelatinous material. The walls become thickened and from this and the internal pressure atrophy of the testis occurs, which indicates the necessity of early operative measures in cases of this type. The diagnosis is usually easily made in acute cases by the history of an injury, the ecchymosis of the scrotum if present, and by aspiration of the sac, which shows a blood-stained fluid.

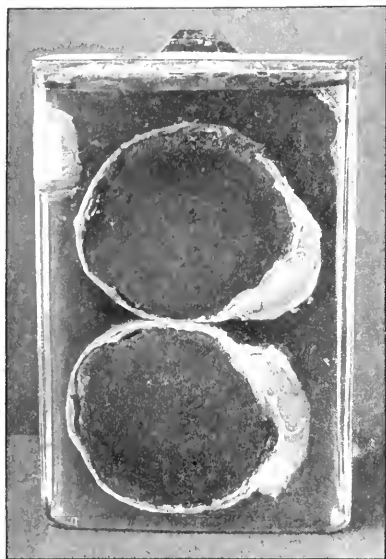
Much greater difficulty in diagnosis is present in chronic cases or in the acute forms where the blood clots fill the sac.

We then have a firm, non-elastic swelling which does not transmit light, is not tender to pressure, and aspiration does not show the presence of fluid because the clotted blood will not escape through the needle. The diagnosis lies between benign or malignant growths, syphilitic orchitis, tuberculosis and certain forms of hernia, as well as hydrocele and extra-vaginal cysts.

The treatment of hematocoele depends upon the amount of blood present and whether it is a primary or secondary form.



In the small collections of blood which form in the cavity of the tunica vaginalis, rest and cold applications should be sufficient to cause absorption of the blood contents. Where a little blood is mixed with the contents of a hydrocele or spermatocele no treatment is required as it is usually not recognized until the fluid is later removed. But in those cases where the quantity of blood is large enough to clot quickly and fill the cavity into which it escapes with a solid mass of clots,



an early operation is necessary. The condition present in such cases is very well shown in the photograph of a specimen of hematocele from the Pathologic Museum of Tufts College Medical School. The cavity of the tunica vaginalis is filled to extreme distention with clots and in the walls may be seen white masses of cholesterol crystals.

An incision and removal of the clotted blood is usually enough for these primary cases but in those secondary to hydrocele the sac should be removed as in the ordinary operation for this disease. In very old cases with thick walls and involvement of the testis a castration may be indicated but should be avoided when possible.

In operating upon cases of apparently malignant disease of the testis the possibility of this condition being present should be kept in mind, and a small incision made into the growth may aid the diagnosis and treatment.

## A STATISTICAL STUDY OF THE MORTALITY FROM DIABETES MELLITUS IN BOSTON FROM 1895 TO 1913, WITH SPECIAL REFERENCE TO ITS OCCURRENCE AMONG JEWS.

By H. MORRISON, M.D., BOSTON.

THE testimony of observers, both in America and in Europe, goes to show that diabetes mellitus occurs more frequently among Jews than among their neighbors. With a view of getting data on this matter at first hand, I undertook a statistical study of the mortality of this disease from the death returns as recorded at the office of the City Registrar of Boston. This investigation covers a period of nineteen years,—1895 to 1913,—during which there were reported 1775 deaths due to diabetes mellitus. Of these, 127 were among Jews out of a total of 6936 deaths from all causes, and 1648 were among non-Jews out of a total of 222,532 deaths.

These figures show that the ratio of the number of deaths due to this disease to the total number of deaths from all causes is 0.018 among Jews and 0.007 among non-Jews. From further analysis I get this ratio to be 0.014 for those of German parentage, 0.013 for those of English parentage, 0.012 for those of American parentage, and 0.009 for those of Irish or Canadian parentage. In Boston, therefore, diabetes mellitus has been twice as frequent a cause of death among those of German, English or American descent as among their neighbors, and two and a half times as frequent among Jews.

### SIMILAR INVESTIGATIONS IN OTHER CITIES.

In a similar study in Frankfurt-a-M., Walbach<sup>1</sup> found that during the years 1872 to 1890 there had been 171 deaths from diabetes in that city; the proportion of deaths from this disease to the deaths from all causes was six times as great among Jews as among the other inhabitants. Auerbach<sup>2</sup> in an analysis of the demography of the Jews in Budapest, Hungary, found that of the 487 deaths reported as due to diabetes during 1902-7, 238, or more than half, occurred among Jews, though they constituted only 23.6% of the population; the rates were 5.9 deaths due to diabetes per 100,000 Catholics and 21.4 per 100,000 Jews. Namyu, Frerich, von Noorden and other specialists in diseases of metabolism also found that Jews supplied an extremely large quota of their patients, suffering from diabetes,—Frerich<sup>3</sup> 25%, and von Noorden<sup>4</sup> as high as 38.8%.

In New York City Stern<sup>5</sup> found the mortality from this disease among Jews in 1899 relatively more than double that among the non-Jews. Rudisch and Aronson<sup>6</sup> have investigated the morbidity of this disease in the New York Mt. Sinai Hospital and compared it with that in four non-Jewish Hospitals in that city; they came to the



TABLE I.

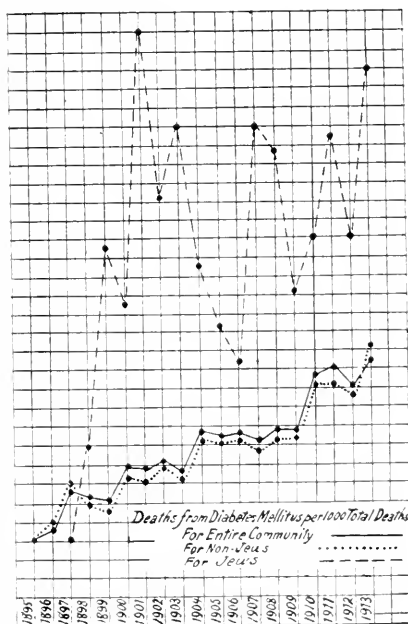
TABLE I.											
Population of Boston.	Estimated Jewish Population.	No. of Deaths from Diabetes.			Total No. of Deaths in Boston.	Total No. of Deaths Among Jews.	Deaths from Diabetes per 1000 Total Deaths.			Deaths from Diabetes Mellitus in Boston per 100,000 Population.	
		Among Non-Jews.	Among Jews.	Total.			Among Non-Jews.	Among Jews.	For the Entire Community.		
1895—	499,017	19,500	35	0	35	11,337	217	3.1	0	3.1	7.1
1896...	511,602	21,000	44	0	44	11,650	258	3.9	0	3.76	8.6
1897...	524,187	22,500	63	1	64	11,170	319	5.8	3.1	5.73	12.2
1898...	536,772	24,000	54	2	56	10,903	252	5.07	7.9	5.14	10.4
1899...	549,357	27,000	53	5	58	11,178	270	4.86	18.5	5.2	10.5
1900...	561,477	27,100	72	5	77	11,371	319	6.35	15.67	6.9	13.7
1901...	568,763	27,200	69	8	77	11,306	268	6.25	30.	6.81	13.7
1902...	576,049	29,700	74	6	80	11,002	282	6.9	21.2	7.27	13.9
1903...	583,335	30,100	69	7	76	11,222	279	6.3	25.1	6.77	13.0
1904...	590,621	31,300	95	5	100	11,383	284	8.55	17.6	8.79	16.95
1905...	597,908	37,200	93	5	98	11,488	343	8.3	14.57	8.53	16.4
1906...	613,075	43,300	97	5	102	11,962	402	8.34	12.4	8.61	16.6
1907...	628,242	47,000	93	11	104	12,313	438	7.83	25.1	8.44	16.6
1908...	643,409	55,500	100	12	112	12,457	506	8.36	23.7	8.9	17.4
1909...	658,576	58,600	97	8	105	11,805	492	8.57	16.26	8.89	15.95
1910...	673,745	59,000	135	9	144	12,282	472	11.43	19.07	11.72	21.4
1911...	688,912	61,500	137	13	150	12,478	529	11.48	24.57	12.1	21.8
1912...	720,031	64,000	127	9	136	12,311	472	10.72	19.07	11.04	18.9
1913...	735,399	66,000	142	15	157	12,563	534	13.3	28.09	12.5	21.3

conclusion that after making all allowances for the chances of error, diabetes mellitus is nearly three times as prevalent among Jews as among their neighbors.

#### THE MORTALITY FROM DIABETES MELLITUS IS STEADILY INCREASING.

There has been a general increase in the mortality of this disease both in this country and in Europe. According to the United States census the death rate from diabetes mellitus was 0.9 per 100,000 population in 1850; 1.1 in 1860; 2.1 in 1870; 2.8 in 1880; 5.5 in 1890; 9.3 in 1900; 14.9 in 1910. In Boston the death rate of this disease was 7.1 per 100,000 inhabitants in 1895; it rose steadily to 21.3 in 1913. In New York City it rose from 2.9 per 1000 total deaths in 1889 to 10 in 1910. In the same terms for Boston, it rose from 3.1 in 1895 to 13.3 in 1913. It is incorrect, however, to assume that this increase is accounted for by the increase in the Jewish population of these cities, as is done by Wilson<sup>7</sup> in the *Medical Record* of 1912, p. 662. He there traces two curves, one showing the increase in the death rate of diabetes in New York City as mentioned above, the other showing the increase in the Jewish population in that city. Because these two tracings are parallel in their upward direction this writer takes it for granted that the increased death rate from diabetes in New York is due to the increase in the Jewish population. The increased tendency to diabetes, however, has been general throughout all civilized communities, even where Jews do not form an appreciable element in the population. Certainly in Boston the increase of the Jewish population has not been the cause of the increased death rate from diabetes. An analysis of the death rate from diabetes per 1000 total deaths during the period under consideration, as indicated by the following curves, shows that it has not been appreciably affected by the death rate from dia-

betes among Jews, though this has been certainly relatively high.



#### NATIVITY.

The largest number of deaths from diabetes in Boston during the period investigated occurred among those of Irish parentage—656 out of a total of 1775—more than one-third. This, however, is not out of proportion, for the Irish are the predominant element in the population of Boston. The ratio of their number of deaths



from diabetes to their total number of deaths is 0.009, while that for the entire community is 0.007. The following table gives the nativity or nativity of the parents of those who had died from diabetes during the period investigated:

TABLE II.

	Non-Jews.	Jews.
Ireland .....	656	
United States .....	642	8
Canada .....	132	
England and Scotland .....	78	2
Germany and Austria-Hungary .....	55	30
Italy .....	21	
Sweden and Norway .....	16	
France .....	8	512
Russia and Poland .....	5	
Azores .....	4	
Holland .....	2	
Switzerland .....	1	
Spain .....	1	
Portugal .....	1	
Finland .....	1	
Turkey .....	1	
China .....	1	
Syria .....	1	
West Indies .....	1	
Philippines .....	1	

Only in eleven instances was diabetes the cause of death in negroes; this is in accord with the general observation that diabetes is not common among the colored races. Among Jews who died from diabetes, the largest number occurred among those who had immigrated from Russia.

## AGE AND SEX.

The youngest case reported as having died from diabetes was that of a newly-born infant taken from a diabetic mother, who also succumbed. The oldest case was a woman of eighty-seven. The largest number of deaths from diabetes recorded was in persons of the seventh decade—60 to 70; the next largest was in the sixth decade. Only one-fifth of the deaths occurred in persons under forty. There was practically an equal number of deaths in children under ten and in persons over eighty.

Contrary to the general observation that diabetes occurs more frequently in the male than in the female sex, in this series there were 958 females, or 55% of the total, and 817 males, or 45% of the total. Above the age of twenty, also, there were more deaths from diabetes among women than among men,—916 to 760.

TABLE III.—DEATHS FROM DIABETES MELLITUS BY AGE AND SEX.

	Under 10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	Total
Males	16	41	64	82	162	176	226	102	6	817
Females	17	25	46	62	124	227	299	132	26	958
Total	33	66	110	144	286	403	525	234	32	

## DURATION OF THE DISEASE.

An analysis of the death returns investigated does not give one anywhere near a true estimate as to the probable duration of diabetes. Of the

1775 returns 567 do not give the duration at all, while 267 have the indefinite terms "years" and "months". Only a little more than half, 951, have the duration of the disease in definite terms. These show that the largest number of deaths from diabetes occurred in persons who had apparently had the disease one year or less. The longest duration recorded was in the case of one man, who had had it for thirty years.

TABLE IV.—DURATION OF DIABETES MELLITUS AS RECORDED IN 1775 DEATH RETURNS STUDIED.

Not given .....	567
"Years" .....	207
"Months" .....	50
1 year or less .....	309
2 years .....	207
3 " .....	102
4 " .....	56
5 " .....	71
6 " .....	26
7 " .....	24
8 " .....	30
9 " .....	8
10 " .....	59
11 " .....	4
12 " .....	8
13 " .....	4
14 " .....	3
15 " .....	17
16 " .....	4
18 " .....	3
19 " .....	1
20 " .....	6
27 " .....	1
30 " .....	1

## COMPLICATIONS.

The following analysis shows the frequency of some of the conditions associated with or complicating diabetes mellitus in the causation of death. Coma occurred in 362 cases; gangrene in 178; pneumonia and bronchitis in 101; tuberculosis in 80; acute infections, as influenza and erysipelas in 68; carbuncle and furunculosis in 36. Cardiac complications are mentioned in 126 cases; renal in 88; hepatic in 4; arterio-sclerosis, including apoplexy, in 94 cases. Neoplasm is spoken of in 22 cases; syphilis in 2; pregnancy in 3; acromegaly and exophthalmic goitre in one each. The pancreas is mentioned in 3 cases.

## OCCUPATION AS AN ETIOLOGICAL FACTOR.

Several observers point out the frequency of diabetes among professional men. In this series of 1775 deaths from the disease 1135 occurred in children, women, and men retired from active life. Of the other 640 deaths 233 were among men in mercantile pursuits, 326 among artisans, and 81 among professional men.

## IS THERE ANY RELATION BETWEEN THE MORTALITY FROM DIABETES AND THE SEASONS?

More of the deaths from diabetes occurred in the six months of cold weather than in the other months. Of the 1775 deaths studied, 1008 took place in the months of January, February, March, April, November and December, as



against 767 during May, June, July, August, September and October. I believe there is no significance in this difference beyond the fact that death rate is generally higher in the winter months.

#### SUMMARY AND CONCLUSIONS.

1. During the period of 1895 to 1913 there were in Boston 1775 deaths from diabetes mellitus out of a total of 229,468 deaths.

2. In Boston, as elsewhere, there has been a steady rise in the death rate from this disease; it was 7.1 per 100,000 inhabitants in 1895 and 21.3 in 1913, or 3.1 per 1000 total deaths in 1895, and 13.3 in 1913.

3. The death rate from diabetes has been relatively very high among the Jews of Boston. The ratio of the number of deaths due to this disease to the total number of deaths from all causes during the period investigated was 0.018 among Jews and 0.007 among non-Jews; so that death from diabetes mellitus occurred about two and a half times as frequently among Jews as among their neighbors. A similar analysis, however, shows that the death rate from diabetes was also very high among those of German, English, and American parentage, 0.014, 0.013, and 0.012 respectively, so that death from this disease occurred about two times as frequently among them as through the community in general.

4. The largest number of deaths from diabetes occurred among those of Irish parentage, 656 out of 1775, or more than one-third of the total. This death rate, however, was not out of proportion to their population. There were only eleven deaths from diabetes among negroes in Boston from 1895 to 1913.

5. This series of 1775 deaths from diabetes is made up of 958 females as against 817 males. This is contrary to the general observation that diabetes occurs more frequently in the male sex. The largest number of deaths occurred in persons of the seventh decade.

6. The duration of this disease cannot be estimated from this study, for nearly half the death returns either did not answer at all this question or gave it in the indefinite terms of "years" and "months". This is a point to be borne in mind in making out death certificates.

7. Why is the death rate from diabetes mellitus rising? Better and more thorough diagnostic methods may be a factor, but only a minor one. Diabetes mellitus keeps pace with the increasing complexity of civilization. It is more commonly found in large cities among individuals and races who are constantly under physical and nervous tension. As Kleen\* puts it: "With greater intellectual exertion, keener emotions, higher nervous development, more earnest struggle for existence, more urgent demands, a more intense culture we are bound to find more diabetes mellitus." It is particularly prevalent among Jews, not because of ethnic peculiarities,

but because a severe environment during many centuries has developed a nervous type easily thrown out of balance.

I wish to take this opportunity to thank Mr. E. W. McGlenen, Registrar of Boston, for his courtesy in allowing me to carry on this investigation in his department.

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### THE TREATMENT OF CHRONIC DISEASE IS A PROBLEM OF APPLIED PHYSIOLOGY.\*

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Pathological-anatomical-bacteriological investigations have contributed much to advance the treatment of acute infectious disease in the last half century, but they have done little to advance the treatment of chronic disease. Though the death rate has decreased by one-half in the last century, and the expectation of life has increased by a dozen years, the improvement is due to progress in the control of acute disease; while the death rate in the registration area of the United States has decreased steadily in the last generation—19.8 in 1880, 19.6 in 1890, 17.8 in 1900, 15.0 in 1910, 13.6 in 1914—the mean death rate for persons over forty years of age, those chiefly affected by chronic disease, has actually increased—3% between 1900 and 1910, and 21.2% between the years 1880 and 1910. Pathological-anatomical investigations have, indeed, tended to decrease rather than to increase optimism; no one who has made himself familiar by actual post-mortem examination with the terribly destructive changes found in the organs in many of the chronic diseases can believe that drugs will restore these organs to their normal conditions. This pessimistic attitude toward the possibilities of treatment in chronic disease is due to a wrong point of view concerning the purpose and principles of treatment: to the fact that too much

\*Part of an address read before the joint meeting of the Association of American Medical Colleges and the Federation of State Medical Boards, Chicago, Ill., Feb. 8, 1916.



emphasis is laid on the anatomy, and too little on the physiology of disease.

The more hopeful light in which the possibilities of treatment in chronic disease are seen when we fix the attention on physiology can be brought out by considering the purpose and methods of treatment.

The aim of treatment in acute diseases is complete removal of disease, or diseased material, or the cause of disease. The antitoxin treatment of diphtheria, and the removal of a diseased appendix are among the best examples. But even in the case of acute diseases like scarlet fever and measles, in which such direct radical treatment is not yet available, and in which the disease must be left to run its course, to be combated by the natural defences of the body itself, the result aimed at, in promoting conditions under which the body will act to best advantage, is also complete removal of all evidence of disease.

In chronic disease, though we often use the direct therapeutic methods of acute medicine, the most important part of the treatment usually has a different objective; it has to do, not with structure, but with function. An organ may be the seat of disease and yet, on account of the very great reserve powers of all the organs, functionally efficient. The normal heart, it has been calculated, can do six times the work ordinarily required of it; and the factor of safety of certain double organs, since one of the pair can be removed without danger to the patient, must be at least 100%. But with severe disease there comes a time when the affected organ cannot do the amount of work ordinarily required of it; the physician is then called in, not to make the organ anatomically perfect, but to restore equilibrium between the work required of the organ and the work which it can do; and though the diseased organ may never be made anatomically normal, it may be made functionally efficient, that is, competent to its tasks. When the heart, for example, becomes so badly affected that the amount of work it can do is less than the amount required, when compensation fails, the leaky valve or other anatomical change responsible for the condition cannot be removed or made whole. But the patient does not demand this; he wants the symptoms alleviated so that he will be more comfortable and better able to do his work; it is not *anatomical integrity* that the patient demands but *functional efficiency*.

Not only in chronic disease, but also in those specific infectious diseases in which direct treatment is not yet available,\* the treatment is directed toward improvement in the function of the various organs. The basis of the trouble in chronic disease is usually a disorder of some special organ or function—the heart, the kidney, the sugar metabolism, for example—and treatment is centered around improvement in the

efficiency of this organ or function; the same methods of treatment are applied in most of the acute infectious diseases, but they are not centered on improvement in the efficiency of any one organ or function.

Functional efficiency may be improved, equilibrium—though perhaps on a lower plane than the normal—between work required and working power may be brought about by two groups of methods: (1) methods which decrease the demands upon organs, (2) methods which stimulate organs to do better work; and therapeutics deals largely with questions of when and how to apply such methods. *Therapeutics is, therefore, in great part, a branch of applied physiology.*

Question may arise as to the correctness of the physiological point of view outlined here. It cannot be denied that the facts upon which the anatomical view of disease are based are as correct as the physiological facts; but facts alone, though they are the elements from which the truth is formed, do not make the truth; the truth has many aspects, and the important thing in determining the best aspect of a truth lies not alone in the correctness of the facts, but in the pragmatic value—in the Kantian sense—that the point of view which results from the selection of the facts and the distribution of emphasis among the facts has as a useful productive agent.\* With this criterion of usefulness as a guide, let us contrast, from the standpoint of therapeutics, the hopeful physiological aspect of disease with the anatomical aspect.

I have already referred to the pessimistic attitude toward the possibilities of treatment in chronic disease resulting from the pathological-anatomical viewpoint; even eminent practitioners, because of the difficulty of believing that treatment can influence the structural changes which the anatomical view brings into prominence, often show a tendency to consider the so-called chronic and incurable diseases as hopeless conditions having an inherent downward tendency. But most chronic diseases do not have a downward tendency; they result in a weakness of function, and if the functional activity of the patient is adapted to his functional capacity the *status quo* may not only be maintained, but often improved. It is a mistake to associate together the words "chronic" and "incurable." The dictionaries (Century, Webster) define "incurable" as "beyond the power and skill of medicine," and give "hopeless"—a term which implies that the physician is powerless—as a synonym. Though the term "incurable" may, possibly, be properly applied to those acute infectious diseases not susceptible of specific treatment, whose course it is "beyond the power and skill of medicine" to influence directly, it should not be used with reference to such conditions as heart disease, Bright's disease, diabetes, and many other chronic diseases; we may, indeed, be unable to influence the anatomical

\* Preventive treatment belongs largely outside the field of what is generally understood as therapeutics. Direct treatment—diphtheria antitoxin, appendectomy, quinine, salvarsan, etc.—is but yet a limited field.

\* Compare Goethe's dictum, "Was fruchtbar ist, allein ist wahr."



changes found in these diseases, the anatomical changes may be incurable; but looked at from the standpoint of physiology, the disease is not "incurable"; the course of the disease, the functional efficiency of the patient, is amenable to, often indeed, largely determined by treatment. A patient whose leg had been amputated would not be sent away with the statement that, since it is impossible for him to grow a new leg, nothing can be done for him; by the use of an artificial leg, and by refraining from certain activities, such a patient can become nearly as efficient as a normal man; the same attitude should be taken toward patients with incurable lesions of internal organs; these patients, too, can often be made functionally efficient.

All this bears directly on the question of the correctness of the physiological point of view. Surely this optimistic point of view is a more useful guide, has greater pragmatic value in therapeutics than the pessimistic anatomical point of view. *If usefulness, pragmatic value, are measures of the correctness of a scientific truth, the anatomical point of view is a wrong one from the standpoint of therapeutics and the physiological point of view is the correct one.*

## ACUTE ARTHRITIS EXPERIMENTALLY PRODUCED BY INTRAVENOUS INJECTION OF THE STAPHYLOCOCCUS PYOGENES.\*

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IN a previous paper,† I pointed out that the staphylococcus organism of shifting grades of virulence localized on intravenous inoculation in different structures of the body, and that within certain limits a selective localization of this micro-organism for special organs could be developed by cultivation of the organism in functioning tissue. I also showed that when the staphylococcus attained an affinity for a certain structure of the body, a fresh subculture of the organism obtained from a focus of infection was apt to possess properties leading to its localization in that tissue.

The following remarks have reference to the production of arthritis by intravenous injection of a staphylococcus. The strain used was the one employed in the gastric ulcer series. It was obtained by blood culture from a case of septicæmia in man. At first, following intravenous injection of the organism into the general circulation of rabbits, the joints of the animals

showed no gross pathological change except a very occasional slight hyperæmia of the periarticular tissues. However, cultures of the apparently negative joints very often yielded a pure growth of the staphylococcus. As negative joints in the early rabbits experimented upon appeared so regularly, examination for arthritis was gradually discontinued; but when rabbit No. 47, following upon an intravenous injection of a ten-day-old agar culture of the staphylococcus isolated from a stomach wall focus of rabbit No. 45, showed distinct lameness in the left hind leg, and at autopsy revealed an acute arthritis, routine examination for joint lesions was resumed.

The material used for injection was prepared by suspending an agar slant culture in about 10 c.c. of normal saline. The usual dose of such an emulsion was 1 c.c. for a rabbit and 3 c.c. for a dog.

In this series all but one animal (a dog) were rabbits. The following are a number of typical protocols of the animals injected after the staphylococcus had attained a sufficient virulence to cause acute arthritis.

Rabbit No. 47, wt. 900 grams, was injected intravenously with one cubic centimetre of saline emulsion made from a ten-day-old agar culture obtained from a stomach wall focus in rabbit No. 45. About 24 hours later, the animal showed lameness especially in the left hind leg, but otherwise seemed quite well. It was etherized and autopsied 36 hours after inoculation. The elbow joints show slight hyperæmia, joint fluid clear and apparently not increased in amount. Both knees are swollen and red. The redness in the right leg is limited to the joint, but in the left leg, it extends down to, and includes the ankle. Incision into the knee joints liberates a thick sanguinous fluid. The stomach, appendix and other organs are negative. Cultures from the joints on agar and in aseptic dextrose broth show a pure growth of the staphylococcus. Cultures of the heart's blood are negative.

Rabbit No. 48, wt. 1025 grams, was injected intravenously with 1 c.c. of the same emulsion used in rabbit No. 47. The next day the animal appeared lame, but otherwise seemed normal. On the second day after injection it was etherized and autopsied. The knees and elbow joints are red and swollen. The joint fluid is increased in amount, that of the elbow cloudy and of the knee purulent. Fresh smears of the fluid show leucocytes, red blood corpuscles and staphylococcus in pure culture. The appendix is very slightly injected and shows two small white areas, which from previous experience, are recognized as foci of the staphylococcus. There is one small abscess in the muscles of the abdominal wall. The kidneys appear slightly congested, otherwise normal. The heart and stomach are negative. Cultures on agar and aseptic dextrose broth yield a pure growth of the staphylococcus.

Rabbit No. 56, wt. 975 grams, was injected intravenously with 1 c.c. of an emulsion of a 20-hour-old agar growth obtained by culturing knee joint of rabbit No. 47. About 72 hours later, the animal appeared very sick, and therefore, etherized

\* Received for publication May 9, 1916.

† Experimental Production of Gastric Ulcer, BOSTON MEDICAL AND SURGICAL JOURNAL, May 11, 1916.



and autopsied. The knees are very much swollen and red. The joint fluid is increased in amount and semi-purulent. The other joints appear normal. The appendix is acutely inflamed. The distal half is turgid, diffusely hyperaemic and rigid. The proximal half shows little change from normal. The heart shows myocarditis. The kidneys, stomach, gall-bladder and skeletal muscles are negative. Cultures of the knee, heart's blood and appendix yield a pure staphylococcus growth.

Rabbit No. 57, half-grown, injected with 1 c.c. of emulsion of the strain used in No. 56. On the fourth day after inoculation, the animal appeared to be very sick. It died the same day and autopsy was made shortly after death. The knee joints are acutely inflamed. The joint fluid is increased in amount and cloudy. The elbows are injected but not appreciably swollen. The gall-bladder is distended and measures two by one-half inches. Its wall is oedematous and studded internally with small white nodules, that under the microscope, turn out to be colonies of staphylococci. The fluid contents of the gall-bladder is mucous-sanguinous and tinged a pale olive green. A fine yellow sediment is found in the dependent portion of the bladder. Fresh smears of the fluid show staphylococci. Stomach, heart and appendix are negative. The kidneys are finely granular and yield a pure culture of staphylococci. Cultures of gall-bladder are also pure growths of staphylococci.

Rabbit No. 63, wt. 1025 grams, injected intravenously with 1 c.c. of an emulsion of a 24-hour old agar slant culture of knee of rabbit No. 57. Animal died about 72 hours later. Left elbow is hemorrhagic. Joint fluid is increased and turbid. Other joints are apparently negative. In the muscles of the legs and abdominal wall are numerous small abscesses. Heart shows myocarditis and endocarditis. Kidneys show a few very small abscesses. Cultures of all the joints, heart and kidneys are positive for staphylococci.

Dog, female, wt. 11 kilos., was injected into femoral vein with 3 c.c. of an emulsion of a 24-hour old agar culture from knee of rabbit No. 56. The next day the animal seemed normal and ate about three pounds of meat. On the second day, after the injection, she began to look sick and moved about with little energy. On the third and fourth days, she would not eat and lay stretched out in her kennel. Her abdomen was tender, rigid and spastic on touch. The floor of the kennel was partly covered with recently coagulated blood. The animal was etherized and autopsied at the end of the fourth day, wt. 9 kilos. While being etherized, considerable dark unclotted blood was discharged by rectum. Knee joints show slight redness of periarticular tissue and cloudiness of joint fluid. Elbow joints negative. Stomach shows a few hemorrhagic erosions. The duodenum shows about two centimeters from the pyloric ring, a necrotic area measuring 6 x 7 mm. The centre of it is a bleeding point and apparently the chief source of blood found in the lower bowel. There are numerous small hemorrhagic erosions throughout the duodenum. The ileum, jejunum and large bowel, except for the presence of blood in the latter, are negative. The appendix shows the mucosa to be thickly studded with punctate hemorrhagic elevations. The kidneys are congested, the gall-bladder is negative. Cultures of the duodenal ulcer,

duodenal and gastric erosions and appendix, show a mixed growth of the staphylococcus and colon bacilli. Culture of the heart's blood shows a growth of staphylococcus in pure form.

#### RESULTS.

The results shown by the protocols indicate that the staphylococcus is apt to localize in the joints and to produce typical lesions of arthritis, if the strain is of proper virulence. The organism recovered from the arthritic lesions has a decided tendency to again localize in joints.

In some cases the arthritis was the only lesion found at autopsy, but in other cases it was associated with one or more other lesions, namely, duodenal ulcer, appendicitis, cholecystitis, myocarditis, pericarditis, endocarditis, nephritis, colitis and myositis. These other lesions will form the basis of future reports.

According to these experiments, it seems to be true that while the organism used (a staphylococcus) may show a predilection for a particular region of the body, it will not always produce a gross lesion at the expected point of attack. In order to produce a gross lesion, it is necessary either for the staphylococcus to be of a certain grade of virulence, or for the tissue in which it has lodged to be suitably altered for the growth and action of the organism. This principle demonstrated itself repeatedly in the course of experimental production of gastric ulcer, and again in experimental production of acute arthritis.

#### REMARKS.

The results of localization obtained in connection with studies of staphylococci are singularly suggestive of Rosenow's<sup>2</sup> results with streptococci. A comparison of the total results in the two series will be made at a future time when the data are more complete. In the meantime, it seems worth the saying that if these facts apply in the cases of streptococci and staphylococci, it would seem to be possible that they may apply to still other organisms, for so far as we can determine, the essential factor governing localization, is growth in the tissue. After an organism has grown in a certain environment, it tends in later generation to select that environment, or at least, to thrive best in that environment.

#### CONCLUSIONS.

It has been pointed out in a previous communication that the staphylococcus may be caused very regularly to localize in the stomach after intravenous inoculation.

It appears that the same organism may be caused to localize in joints and produce typical arthritis.

I wish to express my thanks to Drs. Paul G. Woolley and William B. Wherry for their interest and valuable assistance in connection with these studies.

<sup>2</sup> E. C. Rosenow: Effective Localization of Streptococci, *The Jour. A. M. A.*, Nov. 13, 1915, p. 1688.



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## THE DIAGNOSTIC SIGNIFICANCE OF THE WASSERMANN REACTION.

THE Wassermann reaction for the diagnosis of syphilitic states has now been sufficiently long in use to justify for itself a definite place in the armamentarium of the profession. To neglect its use in suitable cases is to deprive one's self of the most important method in the determination of the presence or, so to say, the past presence of some form of manifestation of syphilis. The importance of being in position to say with some degree of certainty, either in the differentiation from many chronic eruptions or growths of doubtful origin, in congenital cases, with respect to the permissibility of marriage in persons exposed, in many of the parasyphilitic states, as well as in the numer-

ous phases of jurisprudence relating thereto, that syphilis is the causative factor, is obvious. Many of these pathologically obscure conditions may, of course, coexist. With due regard, however, to the important diagnostic value of the Wassermann reaction, its significance must not be overestimated. The reactions, whether positive or negative, must not be taken as absolute in determining the presence or in excluding the existence of syphilitic states.

In general, it can be said of this reaction, as of other serological or allied reactions, that positive results are merely evidentiary, and that negative results do not bar out the presence of conditions sought to be determined by the reactions. A number of conditions, particularly of tropical origin, give positive Wassermann reactions, and hence, where there has been a possibility of exposure to such diseases, they must be excluded before even very positive reactions are resolved in favor of syphilis. On the other hand, in syphilitic reactions, as perhaps nowhere else, the reaction can be innocently, but especially deliberately, masked by a patient in whose interest it may be to hide the presence of the disease. Alcohol, even when not enough is taken to intoxicate, mercury or antisiphilitic treatment of any kind, will act to mask or make negative an otherwise positive reaction.

Moreover, the technic of the reaction is so delicate that the differences between slightly positive reactions, neutral ones, or slightly negative ones are too little pronounced to serve for diagnosis. The many modifications of this reaction that have been evolved in the interest of greater definiteness of reaction, or greater simplicity of technic, all testify to this difficulty. And besides, the personal equation of the serologist enters very largely into the nature of the interpretation put on a particular reaction, especially when it is borderline in degree. Equally good men may interpret a reaction diametrically opposite. Syphilographers appreciate this. They are wont to submit specimens of the blood of the same patient to a number of serologists, and to accept the majority finding, or, if it is a matter of the degree of the reaction, they average the results obtained. Determinations are not made from doubtfully positive or doubtfully negative reactions. Even a very positive reaction should



receive at least one other test, and, if possible, by a different serologist. For most syphilographers a Wassermann reaction has little or no value unless given above the name of a trusted serologist—so much does the value of the reaction depend upon a faultless technique and careful interpretation. A positive Wassermann reaction, at least  $+4$ , is diagnostic when found in conjunction with suspicious symptoms of lues, characteristic sears, parasymphilitic manifestations or the like. While in clinical determinations for the purpose of instituting treatment lesser assurances may be taken, in medico-legal cases or in the establishment of the fact of a cure, perhaps for marriage, the complete extent of the Wassermann assurance must be demanded. If the reaction is deliberately masked or there is otherwise a lack of voluntary coöperation between subject and examiner, the reaction becomes accordingly of less value.

The use of the Wassermann reaction on a rather large scale, as among immigrants, has often been suggested. While undoubtedly a great many positive Wassermann reactions would be obtained, they would be relatively few, and even these would be negatived by the fact that the reaction may be an expression of the many conditions to which immigrants coming from so many places may be exposed. The detection of active syphilitic disease could be more easily accomplished by thorough physical examination. Latent, non-active, and therefore non-contagious syphilis is significant because of the likelihood of transmitting the disease to offspring, but the difficulty of technique, the cost, the uncertainty of results, the ease of masking reactions and the medico-legal questions which would arise would hardly justify its universal use, even to forestall the admission of these undesirable luetic strains. The energy used and the expenditures involved, if applied to more thorough mental and physical examinations, would be of far more value in the exclusion of the unfit.

Until serological examinations are rendered more certain in their meaning, the results must be accepted only when obtained by the most competent workers and with due regard and due allowances for the difficulties, the uncertainties and the personal equations involved.

## THE SOMATIC FACTOR IN MENTAL DEFICIENCY.

INVESTIGATIONS into the causes and into the nature of many forms of mental deficiency have brought out the fact that many of them are due not so much to inherent and intrinsic maldevelopment or deficiency of the brain substance, of hereditary origin, but more often to a great many extrinsic factors which operate to close up certain paths of ingress to the brain and to exclude the necessary stimuli from exerting their influence in its development. Often it serves merely to deprive the mind of such orientation as is required of the mentally competent; more often the lack of it actually retards brain development. As soon as such paths can be made patent mental development can go on as in the normal. The mental deficiency exhibited in those having various sensory or motor defects very well exemplifies this etiological factor. The correction of the sense defects, particularly, "cures" many of those apparently defective. But when these sensory or motor paths are permanently closed and the brain is permanently deprived of these sources of stimulation and fertilization, then the mind remains permanently underdeveloped to the extent of the deprivation. When the extent of these closed paths is not too great there may be no appreciable amount of mental deficiency, unless, perchance, some special knowledge or ability, in which some special paths would operate, is required. Moreover, there are a great many senses outside of the five special senses, the unspecial ones, the non-development of which cause deficiencies of a greater or lesser extent. This can be made to account for many grades of deficiency, usually partial in character, for which no palpable somatic cause can be found, and for which no hereditary taint can be discovered.

The fact, however, that so large a number of the mentally deficient show some tangible cause for their deficiency gives hope that soon most of them will be found of that nature, and that the application of proper corrective measures will help to reduce the number of the misfit. Where, on the other hand, the causes are discovered, but are not correctable, a search can be made for patent faculties, those developed on an intensive scale, and the individual in this way be made useful. The many so-called "savant



idiots" illustrate the possibilities in this direction.

The purely somatic conditions causing mental deficiency are increased indirectly by the mass of deficiencies caused by environmental and nutritional abuses. The anemic, nervous and undernourished children can often be made mentally efficient by proper remedial measures.

The somatic conditions which should logically exercise the greatest influence on mental efficiency, but which are so often overlooked, are the neurological ones. While spinal affections play a small part, except when they reach the higher centres in their upward path, all neurological conditions affecting the brain have a very marked influence on the mind. Whether it is an epileptic condition, an apoplectic stroke, traumatic injuries to the brain, brain growths or other sources of pressure, arterial degenerations and the like, they all show some degree of mental deterioration. Besides, there are a great many lesser neurological conditions of indefinite symptomatology and pathology which are accompanied by rather more definite mental deterioration. Indeed, wherever there are found these vague neurological symptoms accompanying mental deterioration a more thorough search must be made for profound brain changes. There is a tendency to consider these dual manifestations as psychoses, particularly as a late development of dementia precox, when in fact they are regressions in the degree of mental development. In the inherent mental deficiencies there is no mental organization at all because of some somatic change. Here the reverse condition obtains: there is no mental organization because of subsequently acquired somatic etiological factors.

In any event it is very important to differentiate these causes. In the young, where the deficiency is somatic but remediable, proper diagnoses will reclaim a great many. In later deteriorations of neurological origin they will be given proper treatment where possible, instead of considering them dementias of late development and prescribing only custodial care. The diagnosis of mental deficiency as such is fraught with a great deal of danger and often with a great deal of injustice. Causal relations must be searched for in mental conditions as in the physical.

## NOTIFICATION OF PREGNANCY.

SUCH a radical proposal as the one to make pregnancy notifiable will, of course, arouse a storm of protest, especially from those quarters whence comes opposition to all innovations. And yet on examining the idea judiciously we find that it has much to recommend it, the obvious advantages being the beneficial effect which the proper supervision of pregnancy might be expected to have among the more ignorant mothers and the possibility of combating the twin evils of abortion and infanticide.

Dr. S. G. Moore<sup>1</sup> has given the matter considerable attention in the course of the Milroy lectures this year. He calls attention to the marvelous work of Morel de Villiers in France, who accomplished a complete abolition of infant mortality in a small rural community for a ten-year period—1893-1903. This remarkable result was obtained only by the strictest supervision of the period from the recognition of pregnancy until the baby was several years old. One of the features of this system was the compulsory notification of pregnancy. This example has been followed by the borough of Huddersfield, in England, where Dr. Moore is health officer; so far as possible, that is, provisions have been made encouraging the voluntary notification of pregnancy and seeing that such cases are followed up and given every advantage at the disposal of the community to ensure healthy offspring.

As might have been anticipated, the suggestion, which has been made very much in earnest in England, that notification of pregnancy be made compulsory, has been discussed with some heat. Dr. J. W. Ballantyne sums up the arguments for and against rather concisely in the *British Medical Journal* for April 22. The points in favor of the scheme are the statistical studies of pregnancy thus made possible, with the consequent stimulus to study of that important physiological period and the probably resultant check to the frequency of abortions and attempts at them. Against the scheme are its intrusion upon domestic privacy, the difficulties of making an early diagnosis of pregnancy in some cases,—and early diagnosis would be very important, so many abortions being done in the third month or earlier,—and finally the fact that the results aimed for seem to be gradually becoming attained by the modern education of the public in



hygienic matters, more particularly in sexual hygiene. Ballantyne does not believe that the time is ripe for compulsory notification, but suggests that the profession encourage voluntary notification and make it their duty to see that when a case is thus reported the mother is aided in every way possible so that she may herself become an ardent supporter of the system.

<sup>1</sup>The Milroy Lectures, on Infantile Mortality and the Relative Practical Value of Measures Directed to Its Prevention, delivered before the Royal College of Physicians of London, by S. G. Moore, M.D., during March, 1916.

## CRIMINAL ABORTION AND THE WILL TO SURVIVE.

At one of the Boston theatres during the past week there has been displayed to the public, only adults being admitted, a moving picture aimed to impress the laity with some of the evils of criminal abortion. For the first, private performance invitations were issued to a number of clergymen, physicians, and teachers,—men and women. Everyone present was asked to express an opinion in writing; and upon the approval of a majority, the public production of the film was permitted by the censors.

There was in the picture nothing immoral, obscene, salacious or otherwise objectionable. On the contrary, without morbid exaggeration, as in the case of *Damaged Goods*, it presented vice as a

"monster of such hideous mien  
As to be dreaded needs but to be seen."

Unfortunately, it erred in suggesting that abortion and birth-control are practised chiefly by the fashionable and well-to-do, whereas in point of fact they are even commoner among the poor and middle classes. Indeed, this is their greatest evil. If they affected only the rich, they would be of relatively little biologic importance.

Nevertheless, it is probably true that "guilty creatures sitting at a play,"—of whatever class,—may be moved by it. Therefore, it would seem that any effect which this picture might produce should be good,—since it could hardly be evil,—both in the self-conviction and possible reform of the guilty and in the education of the innocent. Whether it will be likely to produce any appreciable or important effect may well be questioned. As a matter of fact,

the control of the evils of criminal abortion, either procured or self-induced, depends ultimately on the awakening of a personal race-consciousness and will for survival among individuals at large. Any educational measure, however, which may aid, even in small degree, towards securing this end in the lay community, is to be approved by the medical profession.

## ANNOUNCEMENT.

### HARVARD GRADUATE SCHOOL OF MEDICINE, COURSE IN MILITARY MEDICINE.

THE Harvard Graduate School announced a course of lectures on Military Medicine to be given during July, chiefly by Major Chamberlain, of the Medical Corps of the Army. Unfortunately it was found at the last moment that Major Chamberlain could not be spared from the Mexican border, but, as he had already sent his lectures to the School, we are able to go on with the course essentially as announced. The lectures will be given by instructors of the Medical School and others, who are familiar with the subjects assigned to them.

These lectures are given in the Administration Building of the Harvard Medical School, at 5 p.m. daily (except Saturdays and Sundays) during July. They are open to members of the profession without charge.

The School will not be able to repeat the course in August, as expected, but will offer similar instruction next fall.

H. D. ARNOLD, M.D.,  
Dean.

## MEDICAL NOTES.

NEW YORK POLIOMYELITIS EPIDEMIC.—The epidemic of poliomyelitis in Brooklyn, N. Y., which we noted in last week's issue of the JOURNAL, continues to spread and seems to be assuming rather serious proportions. On July 1 there had been already 379 cases and 59 deaths; 23 more deaths occurred on July 1, 2 and 3. The New York Health Department is taking active measures to combat the disease and has issued frequent bulletins on the subject. The death rate of this epidemic is relatively high and has been computed as at least 20%, which is four times as great as the death rate during the extensive epidemic of 1907. At



a conference of Brooklyn physicians, held in Polhemus Memorial Hall under the joint auspices of the Department of Health and the special poliomyelitis committee, Dr. Simon Flexner presented a statement summarizing our present knowledge of the disease and the modes of its transmission and prophylaxis. On July 3 the Health Department reported 67 new cases. The Department has begun the distribution of 500,000 warning leaflets based on Dr. Flexner's statements. The Department has also postponed the holding of free open-air moving picture shows which it had been proposed to give during July, and has notified all motion picture theatres in the city not to admit children under sixteen years of age after July 5. On this date the total of reported cases was 702 and of deaths 138 since June 26. The Mayor has ordered a special bond issue of \$80,000 to provide funds for combating the epidemic. Great effort is being made to prevent the exportation of the infection to other cities, but several cases have already developed on Long Island and six at Hudson, N. Y.

**THE AMERICAN POSTURE LEAGUE.**—A joint meeting of the American Posture League and the American School Hygiene Association was held on July 5, in Teachers College, Columbia University, New York, N. Y. Papers were read by Dr. Eliza M. Mosher, Dr. William H. Burnham, Dr. Henry Ling Taylor and others.

**DENTISTRY IN THE FRENCH ARMY.**—In recognition of the importance of well-kept teeth to the soldiers in the French army, over one thousand dentists are employed in the medical corps, five hundred in the trenches and the rest in interior hospitals. Not only are their services demanded in keeping the teeth of the soldiers in good condition, but the large proportion of face injuries has required their most expert surgical skill in repairing and reconstructing damaged jaws and mouths.

**HONORARY DEGREES FOR PHYSICIANS.**—In a recent issue of the JOURNAL we noted the award of several honorary degrees to physicians at American university commencements. The following further awards have also been made: Colby University awarded the honorary degree of A.M. to Dr. James Frederick Hill of Waterville, Me. The University of Chicago awarded the honorary degree of LL.D. to Dr. William H. Welch, professor of pathology at Johns Hopkins University. The University of Vermont awarded the honorary degree of Sc.D. to Dr. Fred H. Albee of New York, and the University of Wisconsin awarded the same degree to Dr. Ludwig Hektoen, director of the Chicago Memorial Institute for Infectious Diseases.

**A GENEROUS MEDICAL GIFT.**—It is announced that Dr. Kenneth Doves of New York has re-

cently given the sum of \$95,000 to the Johns Hopkins Hospital to be devoted to the investigation of tuberculosis and to the training of physicians and students in the recognition of the disease and the management and care of patients.

**PREVALENCE OF MALARIA, MENINGITIS, PELLAGRA, POLIOMYELITIS, SMALLPOX AND TYPHOID.**—The weekly reports of the United States Public Health Service for June 23 and 30, 1916, state that during the month of May in this year there were reported eleven cases of cerebrospinal meningitis in Ohio, twelve in Massachusetts and thirteen in Wisconsin. In Mississippi there were 9,485 cases of malaria, 1,168 of pellagra, 148 of smallpox, 35 of poliomyelitis and 399 of typhoid. There were 87 cases of typhoid in Maryland and 75 in Massachusetts. Virginia reported 807 cases of malaria, 79 of pellagra, 28 of poliomyelitis, 107 of smallpox and 155 of typhoid. In Wisconsin there were 89 cases of smallpox and 41 of typhoid.

#### EUROPEAN WAR NOTES.

**BENEFACCTIONS OF THE ROCKEFELLER FOUNDATION.**—The war relief commission of the Rockefeller Foundation, has recently issued a report showing that during the six months ended June 30, 1916, it appropriated more than \$3,000,000, and has already expended over two-thirds of the appropriation.

"Of the total of \$2,159,985 expended during the six months, by far the largest amount was devoted to Belgium, \$1,290,292 having gone for the relief in that country or among Belgians in other countries. Armenian and Syrian relief was next with \$360,000, and Serbian relief third with \$148,894. An appropriation of \$1,000,000 for relief in Poland, Serbia, Montenegro and Albania is yet to be expended.

"For relief work in and about Constantinople, \$35,000 was expended, while \$55,000 was devoted to the surgical laboratory at Compiègne, founded by the Rockefeller Institute for Medical Research and which is under the direction of Dr. Alexis Carrel.

"Other appropriations made by the Foundation, exclusive of war measures, include: American Academy, Rome, \$10,000; Bureau of Municipal Research, for Studies in the Administration of the Government of the State of New York, \$10,000; International Health Board, \$75,000; general education boards, \$250,000; for establishment and maintenance of school of hygiene and public health at Johns Hopkins University, \$267,000."

**FEVERS OF SERBIA.**—A recent study of fevers other than typhus abounding in Serbia reveals a condition in that section of Europe which is analogous to conditions in the Eastern Orient.



"In the valleys of the Save and the Danube there is a predominance of malarial maladies, the most common of which are the tertiary and double tertiary forms. Related fevers are recurrent, intermittent, oscillatory and some of very short duration. Many feverish states were found which depend upon intestinal intoxications, where there may be demonstrated not only the *B. coli* and types A and B of the paratyphoid organism, but bacteria ordinarily saprophytic, which take on infectious forms. *B. gärtneri* is one of the most common in the intoxications of alimentary origin in Serbia. There is here a great assemblage of fevers, which include Malta and Kala-Azar, and with these septicemic fevers produced by parasites which evolve in the mediums of the blood. Then again there are dysenteries and certain choliform diarrheas which seem to be produced by a vibriion peculiar to these lands."

**WAR RELIEF FUNDS.**—On July 8 the totals of the principal New England relief funds for the European War reached the following amounts:

Belgian Fund .....	\$133,407.15
French Wounded Fund .....	93,664.71
Army Huts Fund .....	66,190.60
British Imperial Fund .....	60,420.10
Armenian Fund .....	53,050.86
Polish Fund .....	38,915.37
Surgical Dressings Fund .....	37,213.87
Facial Hospital Fund .....	22,925.55
Italian Fund .....	20,260.04

#### MEXICAN NOTES.

**SCARCITY OF DRUGS IN THE UNITED STATES NAVY.**—Report from Washington on June 27 states that on account of the Mexican situation, request has been made of Congress for an urgent deficiency appropriation of \$55,000 to make up the scarcity of drugs in the Navy due to the present high price of medical supplies on account of the European War. One of the chief drugs, of which a large supply is required in the Navy in case of actual service, is quinine.

"The advance in the price of quinine has been irregular, ranging from 28 cents or 30 cents an ounce to \$4.00 an ounce, the highest price paid by the Government. The Navy is now purchasing it at \$1.60 or \$1.75, according to the way it can be picked up. At one time when the Government was in urgent need of quinine, dealers offered to sell a ton at \$4.00 an ounce, but this was too steep a price and the offer was rejected. This bid came from Amsterdam by cable and the purchase of a ton of quinine at this price would have cost in the neighborhood of \$125,000."

**MEDICAL TRAINING CAMPS AT PLATTSBURG.**—Report from New York on July 4 states that two training camps for medical men will be

held at Plattsburg for two weeks each, beginning on July 12 and 24, respectively. These camps will be opened to properly qualified physicians and surgeons, who will receive special courses in camp sanitation, military hygiene and first aid.

**BOSTON HOSPITAL UNITS.**—In last week's issue of the JOURNAL we noted the organization by the American Red Cross of a series of thirteen base hospital units in preparation for actual service in the event of war with Mexico, should need require. The three Boston units are based respectively on the staffs of the Massachusetts General Hospital, the Boston City Hospital and the Harvard Medical School. Each unit is to consist of 196 persons, comprising nine surgeons, seven physicians, three laboratory experts, two dentists, fifty nurses, twenty-five nurses' aids, one chaplain, with the necessary orderlies, ambulance drivers, cooks, waiters and clerks. The following is the medical personnel of the three Boston units as thus far constituted:

**Boston City Hospital.**—Dr. John J. Dowling, director; Dr. Edward H. Nichols, senior surgical officer; Dr. Joshua C. Hubbard, Dr. Walter C. Howe, Dr. Halsey B. Loder, Dr. Arthur R. Kimpton, Dr. Robert C. Cochrane, Dr. Irving J. Walker, surgical officers; Dr. Allen Greenwood, ophthalmologist; Dr. Calvin B. Faunce, otologist and laryngologist; Dr. Ariel W. George, x-ray; Dr. John J. Thomas, Dr. William H. Robey, Jr., senior medical officers; Dr. Francis W. Palfrey, Dr. Cadis Phipps, Dr. W. Richard Ohler, Dr. Albert A. Hornor, medical officers; Dr. Edgar M. Medlar, bacteriologist; Dr. Leroy U. Gardner, pathologist; Dr. Edmund W. Wilson, adjutant; Dr. William F. Dolan, quartermaster; and Miss Emma Nichols, chief nurse.

**Massachusetts General Hospital.**—Director, Dr. Frederic A. Washburn; adjutant, Dr. Byam Hollings; quartermaster, Dr. Eustace I. Fiske; assistant director, surgical section, Dr. Lincoln Davis; assistant director, medical section, Dr. Richard C. Cabot; assistant director, laboratory section, Dr. J. Homer Wright; surgeons, Drs. Zabdiel B. Adams (orthopedist), Beth Vincent, William J. Mixer, Ralph A. Hatch (oculist), Elliott C. Cutler, Arthur W. Allen, George A. Leland, Jr.; physicians, Drs. James H. Means, Andrew W. Sellards, George Clymer (neurologist), Paul D. White, Wade S. Wright; bacteriologist, Dr. Roger Kinnicutt; roentgenologist, Dr. Walter J. Dodd; dentists, Drs. Leroy M. S. Miner and Charles W. Ringer; chief nurse, Miss Sara E. Parsons.

**Harvard Medical School.**—Director, Dr. Harvey Cushing; assistant directors, Dr. Richard P. Strong, laboratory section; Dr. Roger I. Lee, medical section; Dr. David Cheever, surgical section; Dr. William H. Potter, dental section; adjutant, Dr. Louis H. Burlingham; surgeons,



Dr. George S. Derby (ophthalmology). Dr. Robert B. Osgood (orthopedics). Dr. Walter M. Boothby, Dr. Edward B. Towne, Dr. Frank R. Ober, Dr. Gilbert Horax, Dr. Samuel C. Harvey, Dr. Harris H. Vail (John Harvard Fellow, 1916), Dr. Thomas R. Goethals (John Harvard Fellow, 1916); physicians, Dr. Reginald Fitz, Dr. George C. Shattuck, Dr. George P. Denny, Dr. George R. Minot, Dr. Henry Lyman; dentist, Dr. Roger B. Taft; bacteriologist, Dr. James L. Stoddard; roentgenologist, Dr. Percy Brown; chief nurse, Miss Carrie M. Hall.

#### BOSTON AND NEW ENGLAND.

**THE WEEK'S DEATH RATE IN BOSTON.**—During the week ending July 8, 1916, there were 215 deaths reported, with a rate of 14.74 per 1000 population, as compared with 183 and a rate of 12.75 for the corresponding week of last year. There were 32 deaths under one year, as compared with 26 last year, and 57 deaths over 60 years of age, against 55 last year.

During the week the number of cases of principal reportable diseases were: Diphtheria, 45; scarlet fever, 14; measles, 202; whooping cough, 15; typhoid fever, 2; tuberculosis, 59.

Included in the above were the following cases of non-residents: Diphtheria, 7; scarlet fever, 5; measles, 1; tuberculosis, 5.

Total deaths from these diseases were: Diphtheria, 4; tuberculosis, 17; measles, 5.

**A NEW OPPORTUNITY: FELLOWSHIPS IN DISTRICT WORK.**—The Harvard Medical School has established four fellowships to be awarded to graduates in medicine, to be known as the Boston Dispensary fellowships. Applicants must have graduated from a medical school of good standing and must have had a hospital internship or its equivalent. Appointments will be made after consideration of applicants jointly by the authorities of the Harvard Medical School and of the Boston Dispensary.

The Boston Dispensary has for 120 years provided medical service to the sick poor in their homes throughout the city, the municipality not affording this sort of service. Under the fellowship arrangement, a portion (for the present not more than five) of the district men will be on fellowship appointment. Negotiations are pending between the Boston Dispensary and the Tufts Medical School with a view of making some similar arrangement for a fellow next year.

The duties of the fellows will be to give a portion of their time to clinical work in the district service of the Boston Dispensary, treating the sick in their homes; and a portion of their time to such study, teaching, laboratory, research or clinical work as may be assigned by the Medical School. The stipend of a fellowship will be \$500 when the physician gives part time, or \$750 when the physician devotes his entire time to

the district work and to the Medical School. A physician desiring to pursue post-graduate study or a course in public health work, for instance, might be enabled through such a fellowship to complete a course in one or two years while receiving at the same time valuable experience.

Application for these fellowships should be made to the Dean of the Harvard Medical School, Longwood Avenue, Boston, Mass.; or to the Director of the Boston Dispensary, 25 Bennet Street, Boston.

#### HARVARD MEDICAL ALUMNI ASSOCIATION.

The annual meeting of the Harvard Medical Alumni Association was held in Harvard Hall, Cambridge, Mass., on June 22, about 150 members being present. The following officers were elected for the ensuing year: President, Dr. Frederick C. Shattuck; secretary, Dr. Arthur B. Emmons, 2d; treasurer, Dr. James B. Ayer. Dr. Francis M. Rackemann, Dr. William W. Howell and Dr. Charles D. Eastman were elected councilors for a term of four years, and Dr. Elliott P. Joslin, councilor for the term of two years in succession to the late Dr. Silas A. Houghton.

**NEW ENGLAND DEACONESS HOSPITAL.**—The new private room annex of the New England Deaconess Hospital at Concord, Mass., the gift of an anonymous donor, was open for public inspection on July 1. The building, completed and furnished at a cost of \$20,000, contains eight private rooms, each with a sun porch and balcony, with nurses' quarters on the second floor.

#### WINCHESTER HOSPITAL TRAINING SCHOOL.

The annual graduation exercises of the Winchester Hospital Training School were held at Winchester, Mass., on June 23. The principal address was by Dr. DeWitt G. Wilcox of Boston. The president of the Winchester Visiting Nurse Association awarded diplomas to a class of three pupil candidates.

#### BROCKTON DEPARTMENT OF PUBLIC HEALTH.

—The thirty-fourth annual report of the Department of Public Health of Brockton, Mass., shows a steadily decreasing death rate and infant mortality rate. The death rate is the lowest since 1890, and the infant mortality rate the lowest since 1896. The birth rate was 23.9 per 1000. The six leading causes of death for the past five years in this city are, in order of their numbers, diseases of the heart and arteries, pneumonia, congenital debility, diseases of the brain and spinal cord, cancer and tuberculosis. Brockton maintains an unusually low infant mortality rate, averaging 2.8 per thousand inhabitants as compared with 3.7 for Massachusetts as a whole. Credit for this is given to the careful inspection of milk and the attention



that is paid to the sanitary conditions of the city. Two baby milk stations were conducted during June, July, August and September, 1915. One station is situated on the east side of the city where the population is largely Jewish and Italian, the other is in the northern section of the city, among the Lithuanian people. A total of 196 babies came under supervision, of which number 98 were brought to the milk station clinics. No deaths from diarrhoeal diseases occurred among these 196 babies.

### Miscellany.

#### RED CROSS APPEAL AND INSTRUCTIONS.

##### AN APPEAL TO THE AMERICAN PEOPLE.

WITH the calling of many thousand men into military service, new and heavy responsibilities fall upon the Red Cross, in its relation to the army and navy on the one hand, and to the people of the United States on the other. At present these responsibilities are, first, to provide assistance to the medical services of the armed forces of the government, by the organization of base hospitals, ambulance columns and other units for the care of our sick and wounded; second, to purchase, collect, forward and distribute supplies for our soldiers in field, camp and hospital; third, to help soldiers' families left destitute and not provided for by other agencies.

For the necessary means to discharge this patriotic service, the Red Cross, in accordance with its custom, turns to the public, whose sympathy and generosity it has learned implicitly to trust. Upon the response to this appeal must depend the adequacy with which the Red Cross will be enabled to help our sick and wounded soldiers, to soften the harshness of field service, and to meet urgent needs among dependents at home.

In anticipation of such a grave emergency as this, the Red Cross has been building up an organization competent to meet the obligations of its national charter and to make effective the generosity of a patriotic people.

Contributions may be sent to the treasurer of the local chapter, or checks may be made payable to the American Red Cross, and sent to national headquarters in Washington.

WILLIAM H. TAFT  
*Chairman, Central Committee,  
American Red Cross.*

##### INSTRUCTIONS TO RED CROSS CHAPTERS.

In accordance with the obligations of its National Charter and in keeping with the recognized purposes of Red Cross societies of all countries, the American Red Cross will parti-

cipate in the care of destitute families of soldiers and sailors called into military service. It is neither the intention nor the desire of the Red Cross, however, to monopolize this work. On the contrary the Red Cross hopes that through the patriotic generosity of employers, and possibly through governmental action, the chief part of this problem may be solved. With private agencies which enter this field the Red Cross desires to maintain relations of close co-operation to the end that the work may be done with efficiency and without confusion.

In its nature this relief work is local in character. It should never lose its spirit of neighborly sympathy and responsibility. For this reason the Red Cross will give its assistance through its Chapter and such other local organizations as it may authorize and will expect that the money and supplies necessary will be contributed by the communities in which the work is done.

##### DUTIES OF RED CROSS CHAPTERS.

In the instructions to Chapters dated June 22d, attention was called to the importance of dividing the work of each Chapter into a Section for Military Relief and a Section for Civilian Relief. The collection, purchase, warehousing, packing and forwarding of supplies to the soldiers and sailors is within the duty of the Chapter Section on Military Relief.

All work pertaining to the relief of destitute families of soldiers and sailors falls within the duty of the Section for Civilian Relief. The following instructions are for the guidance of Chapters in the conduct of relief operations in behalf of destitute families.

##### COLLECTION OF INFORMATION.

In order that the work of relief may be intelligently conducted and with justice to all, a carefully written record is necessary. This record should contain the facts on which the action of the Chapter is based in the case of each family. It should contain the name of the family, number and ages of children, a summary of the family's own resources and a statement showing whether help is also being received from other sources, and if so, how much. This information should be retained until the work growing out of the Mexican disturbance is completed, as it will be needed for reference from time to time and will serve as a basis for a report when the work is finished.

##### DISTRIBUTION OF RELIEF.

Avoid haphazard, spasmodic and irregular methods of administering relief. This duty should be entrusted to a strong, careful, unexcitable committee, and all distribution should be directed and controlled by that committee. It is desirable that the collection of information on which relief is given should also be under



the direction of this committee. A simple record should be kept of all relief given out and to whom given. At the beginning this record may seem unimportant, but as time passes it will be found indispensable if effective and satisfactory work is to be done. It will also be found of value in answer to criticism which is certain to arise.

#### SHALL RELIEF BE IN THE FORM OF CASH OR SUPPLIES?

No iron-clad rule should be laid down as an answer to this question. In general it may be said that money goes farther if it is expended by the committee in buying relief supplies in large quantities, at such discounts as generous merchants will allow. Also many contributions to the Chapter will be in the form of supplies instead of cash.

On the other hand it is probable that the recipients of the help in a majority of instances will be persons who are accustomed to buying for their households and know how to buy with economy. With cash they can buy such things as their families ordinarily use and prefer. The organization for giving relief in money is simpler and less cumbersome than that necessary for distributing supplies.

#### RAISING AND EXPENDING FUNDS.

For the purpose of maintaining the work of relief herein described Chapters of the Red Cross are hereby authorized to solicit contributions of money and supplies from the public, within their respective jurisdictions, and to expend or distribute such supplies and funds under proper safeguards. It is of the utmost importance that an accurate account shall be kept of all money received and all expended. Receipts must be taken for all money paid out, and no money should be paid out except on the approval of a Chapter officer or committee, vested by the Chapter with power to authorize expenditures. These financial accounts should be so complete and accurate that when they are audited later they will show the source of every dollar received and the place where every dollar went. The keeping of the books should be placed in the hands of experienced bookkeepers.

#### TACT AND FAIRNESS NECESSARY

Tact and absolute fairness are essential in the work of the Red Cross. It is to be remembered at all times that the families for whose welfare this work is carried on are independent and self-respecting and are objects of our solicitude solely because their natural supporters have been called into the service of the country to protect the lives and property of our fellow citizens. There is no shadow or taint of charity, in the offensive use of that word, in the work which the Red Cross is doing; it is in fact an attempt to fulfill a sacred obligation which

we owe to the men who are in the ranks for the protection of us all.

ERNEST P. BICKNELL,

Approved: *Director General,*  
ARTHUR MURRAY, *Civilian Relief,*  
*Acting Chairman,*  
*Central Committee.*

The following statement was issued on July 5 by Major General Arthur Murray, U. S. A., Acting Chairman of the Central Committee of the American Red Cross:

"Supplementary instructions for the collecting of military relief supplies as a result of the concentration of American troops on our Mexican border, just issued by the American Red Cross to its chapters and auxiliaries, name six intermediate depots in railroad centres of the United States where supplies should be sent by them to be assorted and classified, and three distributing depots from which final distribution of supplies will be made to the troops at the front. With two exceptions, Cincinnati and Denver, the exact addresses of the intermediate depots are given below. The points selected and the districts embraced are as follows:

"*New York District*, Red Cross Supply Depot, Bush Terminal No. 19, 39th Street and Second Avenue, South Brooklyn, N. Y.—Includes all New England and the Eastern part of New York State.

"*Cincinnati District*, headquarters in Cincinnati, O.—Includes Pennsylvania, the Western part of New York State, New Jersey, Delaware, Maryland, West Virginia, Ohio and Indiana.

"*Chicago District*, headquarters Red Cross Supply Depot, clearing Argo District, Chicago, Ill.—Includes Minnesota, Wisconsin, Michigan, and Northern Illinois.

"*Kansas City District*, Red Cross Supply Depot, care Montgomery, Ward & Co., Kansas City, Mo.—Includes North and South Dakota, Nebraska, Iowa, Northern Missouri, and North-eastern Kansas.

"*Denver District*, headquarters in Denver, Colo.—Includes Montana, Idaho, Wyoming, Utah, and Northern Colorado.

"*San Francisco District*, headquarters Red Cross Supply Depot, care Mr. A. B. C. Dohrmann, San Francisco, Cal.—Includes Washington, Oregon, Nevada, and Northern California."

The headquarters of the following additional three districts are designated "distributing depots":

"*Douglas, Ariz.*, headquarters Red Cross Supply Depot, care Mayor W. H. Adamson.—For all of Arizona and the southern part of California (Los Angeles).

"*El Paso, Tex.*, Red Cross Supply Depot, 516 San Francisco Street, El Paso, Tex.—For all supplies from intermediate depots at Kansas City, Denver, San Francisco, and from all territory west of Kansas not otherwise embraced.



"San Antonio, Tex., District, headquarters Red Cross", apply Depot, Avenue E and Fourth Street, San Antonio, Tex.—For all supplies from intermediate depots at New York, Cincinnati, Chicago, and from all southern states situated to the east of a north and south line through the western boundary of Kansas.

"Each depot will be under the charge of a manager who will have general supervision over the receipt, storage, and shipment of the supplies, and, in the case of distributing depots, of their final disposition. Instructions for the shipment of supplies to, and operation of, these depots have been prescribed at length—those relating to shipment of supplies may be obtained on application to Chapters.

"These intermediate and distributing depots having been established by the Red Cross for the purpose of facilitating the distribution of supplies from all parts of the country to our soldiers and sailors, the Red Cross would be pleased to have all patriotic American citizens and associations desiring to give aid and comfort to them make use of the facilities thus afforded by its system of depots for the shipment and distribution of supplies on the Mexican border.

ARTHUR MURRAY,  
Major General, U. S. A.,  
Acting Chairman, Central Committee,  
American Red Cross."

## Correspondence.

### A QUESTION OF MEDICAL ETHICS.

WAUKESHA, WIS., July 1, 1916.

Mr. Editor: For many years now the profession of medicine has been purging itself of poor medical schools. We have been trying to standardize the schools so as to eliminate the poor ones, to standardize hospitals and, in general, raise the level of medical education and through education the level of practice. The results of all this work are known to all the press and the public.

Physicians do not often go into print themselves but many give their time freely to interviewers who are better qualified to write their material up and who are given a wider hearing.

Recognizing as we have the tremendous inferiority of many happily defunct schools of medicine or diploma factories it is a sore in our side that the product of these schools, thousands in number, have to a greater or less extent obtained the confidence of the public and worse yet are virtually protected and shielded by the profession itself. Many of them are totally incompetent, and many are actuated by no desire to help humanity. Yet it is insisted upon by our code of ethics that nothing damaging to the profession should be allowed to get to the public ear. Criticisms should be made only in medical publications. There is no profession which holds its code of ethics so jealously. We are always suspicious of people who parade their virtue. They are more than likely to be assuming a virtue if they have it not.

It seems to me that we are decidedly at fault and that it is a false sense of loyalty that causes this

state of affairs, and the public has a perfect right to call us inconsistent and insincere.

Isn't our duty to the public as great or even greater than to the unit practitioner? Is it always necessary for the consultant to leave the impression with the family that the general practitioner is doing exactly the right thing? Even if no harm results from his ignorance, is it right to leave the impression that he is a proper guardian of the health of that family? Should we always shield the practitioner who never ought to have left the plow? Is the public expected to discriminate in matters medical? You can claim that tact will obviate all difficulties between consultant, practitioner and family, but it won't. It can't make a good practitioner out of a man who never made a physical examination.

In the first place we are all too afraid of admitting our mistakes and too afraid of telling other people theirs. More frequent consultations among physicians, group action, frank correction of mistakes and admission of error would in a short time benefit people and physicians both and would lead to a better understanding and ability to cooperate, which is lacking at present.

Our loyalty to false standards of loyalty creates between the profession and the public a legitimate atmosphere of suspicion, and in the profession it creates insincerity and lack of frankness. Our reluctance to admit our faults to the public and our mistakes among ourselves leads to outbursts of criticism when such an article as Dr. Cabot's "Better Doctoring for Less Money" appears. It almost makes our judgment final that acrid criticisms come from those whom the cap fits or from those inspired by false standards of ethics.

The assumption of knowledge in all branches of medicine is an admission of ignorance and to point out this fact should cause no great stir nor adverse criticism.

Let us get together in groups and clubs and put aside petty jealousies and work together for the common good. If we worked in harmony more and talked harmony less, advance in medical practice would be assured and unobstructed.

H. P. GREELEY, M.D.

### CHANGES IN THE MEDICAL CORPS, U. S. NAVY, FOR THE WEEK ENDING JUNE 24, 1916.

June 16: P. A. Surgeon J. A. Biello, detached from the *Kentucky* to home—wait orders.

P. A. Surgeon W. A. Bloedorn, detached from the Navy Yard, Washington, D. C., ordered to the *Kentucky*.

P. A. Surgeon P. T. Dessez, ordered to Navy Yard, Washington, D. C.

June 19: P. A. Surgeon F. G. Abeken, to Naval Hospital, Great Lakes, Ill.

Surgeon C. C. Grieve, detached from Naval Hospital, Great Lakes, Ill., and ordered to the *Utah*.

June 21: P. A. Surgeon G. C. Thomas, detached from Naval Station, Guam, and ordered to the *Fulton*.

P. A. Surgeon A. B. Hayward, ordered to the *New Orleans*.

P. A. Surgeon W. H. Connor, detached from the *Fulton*, and ordered to the *Kansas*.

### RECENT DEATHS.

DR. JETUS HAYDEN WOODWARD, who died in New York, N. Y., on July 2, was born in 1858 at Castleton, Vt. He graduated from Cornell University and the College of Physicians and Surgeons of Columbia University. He spent some time in studying abroad and at one time taught materia medica at the University of Vermont. As a specialist in disease of the eye, ear and throat he attained much prominence.



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## Memorial Addresses.\*

DAVID WILLIAMS CHEEVER, A.M., M.D.,  
LL.D.

I.

By GEORGE W. GAY, M.D., BOSTON.

ANY eulogy of Dr. Cheever is to be limited only by good taste and discretion. It would be difficult to overestimate his sterling character, his high ideals, his pure motives, his strict integrity and his exceptional service to the profession. His life was replete with wise and efficient activities. For more than half a century he was held in the highest esteem by the leaders in the medical profession, the court of last resort in determining the character and ability of any physician. He has been so prominent in the medical world and for so long a period, that it is difficult for us to realize that we shall see him no more in his usual walks in life, the sick room, the hospital, the medical school and societies and in the community.

Born in Portsmouth, N. H., November 30, 1831, he died in Boston December 27, 1915, having just entered his eighty-fifth year. He was the son of Dr. Charles Augustus and Adeline (Haven) Cheever, and the grandson of Dr. Abijah Cheever of Revolutionary fame. He was prepared for college at home under private tutors and received a thorough drill in the classics, of which he was very fond, and which he continued to read in the original all his life.

\* Read at a meeting of the Boston Society for Medical Improvement, on April 3, 1916.

He entered Harvard College in 1848 and graduated four years later. Among his classmates was the Hon. Joseph H. Choate.

Descended from a long line of intellectual ancestors, born in a professional atmosphere, endowed with a well-balanced mind, a judicial temperament, a clear vision of duty and a devotion to ideals that nothing could discourage, he was peculiarly fitted for his future successful career. He was proud of his lineage and justly so. He came from good old English and Colonial stock, than which there is none better. He was seventh in descent from the Puritan, Ezekiel Cheever, who came from Canterbury in 1637, was the first master of the Boston Latin School, and for seventy years a noted teacher in this vicinity. Dr. Cheever's father and grandfather were accomplished physicians and surgeons for their time and had extensive and varied experiences. With such a lineage and surrounded by such favoring influences, it was but natural that he should follow in the footsteps of his ancestors and enter the medical profession.

Graduating from college in 1852, he spent a year and a half in Europe, then entered the Harvard Medical School, from which he graduated in 1858 in a class of twenty, one-half of whom saw service in the Civil War, among whom was Dr. Cheever. During his pupillage he attended a summer term at the Boylston Medical School, a short-lived but very good school. Some of the teachers later became professors in the Harvard Medical School, among whom were Drs. E. H. Clark, Charles E. Buckingham and H. W. Williams. Evidently the time was not



ripe for more than one medical school in this city.

The impression seemed to prevail in those days that the internes at the Massachusetts General Hospital, the principal one in this part of the country, received their appointments chiefly through social and family influences. While such may have been, and doubtless was, the fact in many instances, yet it was by no means universal, as is shown by the incumbents. Dr. Cheever very likely shared in the prevailing opinions, for instead of applying at that hospital for the position of house officer, he sought and obtained that of house pupil at the State Hospital at Rainsford Island, where he remained one year before taking his degree and received an excellent training under Dr. Lothrop in medical, surgical, contagious, venereal, children's, and all the diseases found in a large general hospital. There was a maternity department and also a smallpox pavilion. The house pupils prepared and dispensed medicines, made autopsies, dissected and prepared skeletons and had a varied and valuable experience which gave them an unusual preparation for entering general practice.

Dr. Cheever's professional growth was steady and continuous. Soon after his graduation he received the appointment of demonstrator in anatomy at the Harvard Medical School, a position that he held for eight years, thereby laying a firm foundation for his future brilliant career as a surgeon and a teacher. From the demonstratorship he became adjunct professor and then professor of clinical surgery. Later he was appointed professor of surgery, which position he held for ten years, to the great satisfaction of all concerned. He was made professor emeritus in 1893 and Dr. Warren succeeded to the chair in surgery.

In the early years Dr. Cheever did whatever came to hand, as most beginners in our profession are obliged to do. To eke out a small income, he wrote for some of the leading magazines, as the *Atlantic Monthly*, the *North American Review*, and he wrote the Boylston Prize Essay, all of which brought in much-needed money. He served at the Boston Dispensary as surgeon for five years, attended the patients in a smallpox hospital for a year and led a very busy life, if not a very lucrative one; that was to come later. He was a frequent contributor to the medical journals, published a volume of Surgical Lectures of lasting value and interest, and for twenty-five years was the principal editor and instigator of the medical and surgical reports of the Boston City Hospital, reports that he was instrumental in establishing. He served his alma mater for twelve years as overseer, and for an equal length of time was a trustee of the Mt. Auburn Cemetery. While occupying the latter position he became interested in cremation and exerted himself to establish a crematory there. This was accomplished, and he showed

his consistency by directing that his body should be disposed of in that way.

When the Boston City Hospital was opened in 1864, Dr. Cheever was appointed visiting surgeon, the youngest on the surgical staff. This position, in conjunction with that of prosector in the school, gave him an unlimited field for the development of his powers. How well he improved his opportunities is now a matter of history. For fifty-two years he was connected with the institution and was the last surviving member of the original surgical staff. During his active career he was a leader in the staff's activities. He inaugurated the surgical clinics; he established or encouraged the Sunday conferences of the visiting surgeons, a most interesting and useful function; he fostered public operating days; attended and took an active part in the clinical meetings of the staff and invited the outside physicians to visit the hospital freely and frequently for the purpose of familiarizing themselves with the work of the institution. In short, he was foremost in every effort to develop the hospital and place it in the front rank of municipal activities. Two novel features of this institution always excited his heartiest commendation; those were, first, the privilege granted by the trustees to the staff to nominate their own colleagues, and second, the competitive examinations of house officers. In his opinion these features conduced very materially to the harmony and efficiency of the staff and the welfare of the hospital.

He always considered that his hospital patients had prior claim upon his time and attention. He could turn his private patients over to an assistant, but, as they had no junior visiting surgeons in those days, he and he alone was responsible for the former class and must do the work. He was appointed for that purpose. The visiting surgeon had from sixty to one hundred patients under his care. He did all the operating and made many of the complicated dressings. Dr. Cheever was especially attentive in his after-care of serious operations, feeling that the results not infrequently depended thereon. Temperamentally he was a caretaker. He showed this trait not only towards his patients and friends, but also to the house officers and the nurses. He looked after their health and comfort, as well as their daily work. His thoughtful consideration won their respect and admiration. It was his invariable custom to treat his charity patients with the same care and consideration that he bestowed in his private practice. The quality of service was alike in both.

His career as a general practitioner was marked by the same broad grasp of the situation and the close attention to details that characterized his surgical work. He was, as before mentioned, a natural-born caretaker, and his interest was by no means limited to the sick. It extended to every one with whom he was



brought in close contact. He noticed everything and was ready with suggestions appropriate for the occasion. As might be expected, his patients had unbounded confidence in him, and many became his lifelong friends. He was, indeed, a tower of strength in times of trouble.

As a surgeon Dr. Cheever was safe, enterprising and dependable. Painstaking in arriving at a diagnosis, deliberate and careful in his operations, bold in emergencies, fruitful in resources, thorough in his work and most assiduous in the after-care of his operative cases, he long occupied a foremost rank in this branch of the profession. He did many bold, original or unusual operations that gave him an international reputation. He never forgot patients whom he had treated for a serious illness, or upon whom he had performed an important operation. He kept track of them as long as possible, thereby accumulating a mass of knowledge that was of great service in making him a broad-minded, efficient practitioner and consultant. He was a constant attendant at medical meetings, speaking and presenting papers frequently, a large number of which are to be found in the current medical literature of the time. He believed that papers worthy of presentation to a medical society should be published, and acted upon that principle, to the benefit of the profession and the public.

As a teacher in the medical school Dr. Cheever made a lasting impression upon the thirty-three classes of students that received his instruction. Plain, practical facts formed the basis of his teaching. In his opinion "pre-digestion, terseness and extemporaneous speaking" were the elements of his success in that work. Realizing the fact that most of his students were to earn their living by caring for the sick and injured, he endeavored to fit them for that task in the best possible manner. He had unbounded respect for facts; less for theories. Above all else, he was practical. Given such and such conditions, what are the proper measures to be taken to correct them, so far as may be? That is the sum and substance of practical instruction in our profession. He heartily approved of the suggestion that the Harvard Medical School should demand and provide a hospital service, as one of the requisites for graduation. It is to be hoped that some such scheme can be established in the near future.

Dr. Cheever was an active factor in the re-organization of the Harvard Medical School in 1871, when the present efficient graded course of instruction and examination was inaugurated. He supported President Eliot loyally in this struggle and lived to see the fruits of the wise movement. It was a great advance in medical education, and the promoters thereof may well be proud of their work.

The doctor was a public-spirited citizen, deeply interested in and thoroughly informed upon current events. Independent in politics,

but usually voting with the Republicans, except when he thought they strayed too far from the right course. He did his own thinking, formed his own opinions, had the courage of his convictions and acted in accordance therewith honestly and fearlessly.

Considering the fact that he was never rugged, physically, the amount of work that he was able to accomplish was marvelous. Five feet ten inches in height and weighing one hundred and thirty pounds, pale complexion, subject more or less to dyspepsia, which disappeared at sixty, on giving up meat, he lost little time by reason of ill health, until 1885 when he contracted septicaemia (blood poisoning) and was more or less incapacitated for a year. His capacity for work depended in no slight degree upon his serene temperament, his latent endurance, his complete self-control and the careful regulation of his daily life. He never made "coat-tail" visits, but, in accordance with a hint from his friend and teacher, Dr. James Jackson, one of America's wisest physicians, he always removed his overcoat and showed no haste until he was out of the house. No time was wasted, but his patients would not suspect that he had more work than he could easily attend to, or that he was in haste to get away.

Physicians should not have impulses, or, having them, they should not be acted on, until they have been subjected to the alembic of reason. Many a mistake is due to the neglect of this precaution. Dr. Cheever never acted upon impulse. He was a typical example of wise preparedness. It was one of his fundamental principles of life. It was his custom to review the steps of all important operations and to lay out the plan of his lectures the evening before. He never depended upon the inspiration of the occasion for what he should do, or say. So far as possible, he was thoroughly prepared for all emergencies. His foresight and forethought prevented mistakes, inspired confidence and insured favorable results. He was deliberate in forming his opinions, but once formed, they would stand rigid examination.

The doctor took a lively interest in the substitution of the present system of medical examiners for the old and oftentimes disgraceful coroner system, in which medical problems were left for decision to laymen who were paid by the job. Business, rather than justice, seemed the ruling motive in many instances. A flagrant case in which a young and innocent woman, a patient of the doctor's, was disgraced, another honorable physician insulted and humiliated and the family and friends distressed beyond measure was the final straw that roused public indignation and swept the system out of existence in this state.

Our friend was an effective speaker before legislative committees. Calm, deliberate, sensible, his remarks always carried conviction to reasonable persons. They could see at once that



he had no axe to grind, but was sincere, fair and unprejudiced. At one time he appeared, as an expert, in court frequently and, while he was an excellent witness for the truth, yet he considered it the most unsatisfactory of all his activities. To quote his own words, "I can almost say that I never left the court after testifying with a feeling of honorable satisfaction, or that I had been allowed to tell the exact truth after complicated questions and having my mouth shut by technicalities." He was an admirable witness for the right side, but he could not be swerved a hair from the truth, as he understood it. Upon the witness stand he was calm, collected, never lost his head nor his temper; simply answered questions in the shortest possible manner, volunteered no remarks or comments and left the impression of unbiased, disinterested evidence.

The doctor firmly believed that in important cases the court should be authorized to summon an expert, as now may be done in this state in criminal cases in which the sanity of the defendant is an issue. At present, medical expert testimony is bought and paid for irrespective of justice and regardless of the oath taken to "tell the truth, the whole truth and nothing but the truth," a resonant fiction sanctioned only by long usage. Cross-examination is supposed by the uninitiated to have for its object the elucidation of the truth, rather than the confusion of the witness and the jury. Dr. Cheever finally refused to accept this sort of service and appeared in court only when legally required to do so.

Dr. Cheever devoted no small portion of his active career to the service of medical charity in private as well as in his hospital practice. He fully appreciated the fact that medical charity is abused in our hospitals and dispensaries, and that thus far the efforts for its correction have been only partly successful. Paternal legislation takes no heed of the doctor who is required to care for the injured who are placed in our public hospitals by the insurance companies, and a movement is now on foot to include the sick in this class. The hospital is paid, the patient is paid, but the doctor gets nothing, although his services are the chief factor in the transaction. As Dr. Cheever has well said, "Hospitals impoverish the doctor and enrich the public. Hospitals benefit the professional knowledge and pick the professional pocket. . . Whom does the abuse of medical charity injure? It breeds pauperism and it robs the doctor." "To adjust the very delicate balance between our duty and our rights, between the abuse of our charity and our right to earn a living, is now a pressing and a daily problem."

Among his numerous charitable activities, Dr. Cheever established a scholarship in the Harvard Medical School for the benefit of deserving first year students, at that time the only one in

the institution for that class. He also gave a fund to the Boston City Hospital for the benefit of the graduates of the surgical department of that institution. For many years he was president of the Massachusetts Medical Benevolent Society which furnishes aid to needy physicians and their families. He was a liberal contributor to its funds and retained his interest in the society throughout his professional life. His charities were numerous, and few worthy applicants were refused aid of some sort.

Unlike too many in our profession, the subject of this sketch was an excellent business man, safe, sound and conservative. He realized the fact that the time may come in the life of any one when a dollar will be his best friend. His charges were moderate and in strict accordance with the fee-table in vogue in this vicinity, which he helped to establish. He was prompt in presenting and collecting his bills. His investments were safe and judicious and largely in live real estate in his home city, where it was under his personal observation. Speculation, promotions and "wild cats" had no temptation for him; safety and stability were his guiding principles.

His business operations were conducted upon the same high, ethical plane, as were his professional activities. In his opinion no transaction was really profitable unless it was profitable for both parties. For lasting results there must be reasonable satisfaction on both sides. He took much interest in the up-keep of his properties. For several years he had made it a practice to visit frequently every building that he owned, usually on Sunday, and took pride in calling attention to their excellent condition as regards repairs and hygiene. No liquor was allowed to be sold on his premises under any circumstances, a fact that diminished his income considerably. He was unalterably opposed to the traffic, as he, like every physician, was well aware of the evil results of the abuse of alcohol, and he would have no part in the business even as a landlord.

The professional and financial career of his many students always interested him deeply. He kept track of them so far as possible; his advice and encouragement were always at their service. As he has so truthfully said, "The welfare of my medical brethren has been in my thoughts prominently and permanently. I have tried to advance our profession." In the opinion of the writer, a physician beginning practice with nothing except a debt, who arrives at a stage in his career when he can live on his income without work, has achieved a financial success. Too few in our profession ever reach that situation. Dr. Cheever was fortunate in that respect, as in many others. Although he was eleven years in reaching his carriage, yet he was laying the while a foundation that brooked no reverses and his financial growth was as steady and complete as was his professional development.



Dr. Cheever's devotion to his profession was a precursor of his success. His whole time and strength were given to his work. His motto was, "Difficulty, Struggle, Progress." Beneath that calm, modest exterior was a will of iron and a determination that brooked no defeat. Nothing was permitted to interfere with his professional duties. He was always at the service of his patients and his fellow practitioners. As he has so tersely said: "Whatever success I have won as a doctor has been due to a peculiar quality of my mind, concentration; one thing; only one thing; always one thing. A doctor; only a doctor; always a doctor. One school; one hospital; one pursuit; one profession. That has been my rule and my course." Such was his life-work, as he summed it up, and its results are known of all men.

When Dr. Cheever had passed the zenith of his activities, the writer once asked him if he would choose the same profession again in the light of his experience. After a little hesitation, so characteristic of him, he replied, "I think I should, as I am better adapted for the medical profession than for any other calling." Happy indeed must any one be who can say at the close of a long career that he made no mistake in choosing his vocation.

Dr. Arthur B. Emmons, 2d, in his interesting paper on "The Profession of Medicine," has shown that the graduates of the Harvard Medical School are, as a rule, very well satisfied with their choice of an occupation. In reply to a similar question, 226 replied in the affirmative and only 16 in the negative. At the writer's last interview with the subject of this sketch he spoke of this paper with much interest. It had been read to him and had received his usual careful consideration. He thought that the prospects of the general practitioner were less promising than formerly by reason of the great increase in hospitals, dispensaries, specialists, and the paternal and socialistic trend of present-day legislation. He was not at all misanthropic in his views, and he believed that the situation would work out in the right way in time. It simply remained for us to accommodate ourselves to conditions as they came along. He had unbounded faith in the nobility of his profession.

Dr. Cheever was a forceful advocate of privileged communications between physician and patient and wrote and spoke thereon upon every appropriate occasion. Except in criminal cases, he claimed that the patient's record should be held sacred; that if justice demanded its revelation, it should be given privately before the judge rather than in open court. It may be needless to say that no inconsiderable proportion of the profession agrees with him in that opinion.

The medical defence act of the Massachusetts Medical Society, a species of mutual insurance against blackmail, met with Dr. Cheever's ap-

proval. By this act, counsel is furnished to the members, free of charge, in their defence in any fake suit that may be brought for alleged malpractice. In effect it discourages shysters in their efforts to secure hush money from physicians by threatening suits. The act costs less than twelve cents, annually, per capita, and has proven itself beneficial here, as it has done in twenty-four other state medical societies. It has evidently come to stay.

The recreations of our friend were walking, rowing, fishing, horseback-riding and the gymnasium. He was also fond of music and travel. He made several trips to Europe, taking much interest in art, and especially in sculpture. Rome was especially enticing on that account. Scenery upon a large scale had peculiar attractions for him. For twenty-one years his summers were spent in Cohasset upon a bluff overlooking the ocean, giving a view of which he never tired. In his fishing trips it was of little importance to him whether he caught anything or not; it was the open air, the vast expanse of water and sky with their endless changes that appealed to him. The loss of a daughter from drowning, the saddest bereavement of his life, sent the family to a farm in Dedham for the subsequent seasons. Here he took great interest in the various activities about him. His children and grandchildren were a source of never-failing delight to him. Dr. and Mrs. Whitesides' children from Portland, Oregon, spent their summers at Dedham and there was "something doing" all the time. The writer had the pleasure of giving Dr. Cheever his first ride in an automobile. The cold wind and his efforts to save his hat were far more in evidence, than was any enthusiasm over the trip!

While Dr. Cheever was not a religious man in the ordinary acceptance of the term, yet he was deeply reverent. His mind was essentially scientific, and that is usually reverent, less frequently religious. As he so well says, "Research widens the view and breeds reverence, not for myths and legends, but for infinite facts. Knowledge grows always. Medicine has a religion of its own, useful, immediate, daily. With reverence for what it cannot understand, it takes up and pursues its daily tasks with patience and in the love of man, with the hopes for more knowledge, more usefulness, and these are fulfilled in the succeeding generations."

Many years ago, while performing a critical operation upon a woman's neck, the patient suddenly collapsed from an air embolism (air in the veins), and for a few moments was apparently dead. Under appropriate measures she rallied, the operation was completed and the patient was sent to the ward. Turning to his house officers, Dr. Cheever said, "Where was that woman during those few moments, when, to all outward appearances she was dead?" The world has been asking that question ever since time began! Upon another occasion, while enjoying



a magnificent view in the Adirondacks, he called his daughter's attention to a beautiful flower growing at their feet, and said, "The Power that makes that flower grow upon this mountain can be trusted. Whatever the future holds is right." That he fully realized the comfort and support to be derived from religion under certain circumstances is shown by the following quotation from his writings: "No one can appreciate or bear warmer testimony to the good influence of the offices of the church on the poor sufferer's mind in preparing him for an operation, or some desperate struggle for life, than the hospital doctor. Calmness and fortitude displace fear; the mind is made up; confidence assured, and this is half the battle. The priest always sides with the doctor. His services are invaluable." A mind of the caliber of Dr. Cheever's could but meditate deeply upon these subjects. He was too wise, too logical and too reverential to doubt for one moment all the attributes of entire trust in a Supreme Being.

Even were this the time and place, the writer could hardly trust himself to trespass upon your time and patience by alluding to any extent to his personal relations with Dr. Cheever, which began in 1864, and terminated only with his life, a period of more than half a century. I saw him first in the front row of seats reserved for physicians in the old operating room in the cupola of the Massachusetts General Hospital. A slender, fair haired, neatly dressed young man with his hand done up in a black silk handkerchief, Dr. Cheever was recovering from a septic wound of the finger. Our acquaintance began in the old dissecting room in North Grove Street; then came a year as house pupil at Rainsford Island under his chum and classmate, Dr. George L. Underwood, next as his house surgeon at the City Hospital, then surgeon to outpatients, on his recommendation, and finally his colleague, as visiting surgeon, to the close of our active professional lives. As an example, an adviser and a friend, he was all that could be desired: faithful, loyal, reliable under all circumstances. Even at our last interview, a few days previous to the onset of his final illness, he gave me valuable advice relating to the curtailment of certain activities, with all the alertness and interest of half a century's duration. Truly, such friendships make life worth the having. One is tempted to linger over these pleasant reminiscences, but memory alone must suffice for the present.

Dr. Cheever was dignified, reserved, even austere in the opinion of those who had only a slight acquaintance, yet those having a closer relation found him most cordial, genial and sociable. He had a keen sense of humor and was quick to see the inconsistencies of people. He was kindly in his criticism, lenient in his judgment of human frailties, but not of crime or brutality. Justice was a cardinal principle with him, and he believed in human responsi-

bility. The writer has permission to quote the following tribute to Dr. Cheever's character from a personal letter from Dr. Henry P. Walcott: "Dr. Cheever has always represented to my mind the best example of a model for our profession; he appeared so to me when I first came in contact with him as prosector in the school, and when he rose to his high eminence, he lost none of his high leadership. We are too apt, I think, to complain of a degeneracy in our people, and whatever our failings may be, and I know that they are many, yet I think of no man who at any time better represents the strong characteristic of our race than did he. It adds to our confidence in the future that we have had such a man in our day."

While we may not intrude too much upon the home life of Dr. Cheever, yet we may be permitted to note the fact that it was all that could be desired. Unselfish, kindly, just, full of tender consideration for each and all, he was an ideal husband, father, companion. His married life of over fifty-five years is a blessed memory in the household. His chief pleasure was found in the family, and always to be shared with its members. He was essentially domestic. While he took keen enjoyment in the companionship of patients and friends, yet the home life was the principal refuge for rest and comfort.

Fortunate, indeed, was Dr. Cheever in having a son who, in every respect, is worthy of the name and who, as a member of the surgical staff of the Peter Bent Brigham Hospital, will sustain the enviable reputation of his ancestors. His three sons were a source of great satisfaction to the grandfather, not only for their personalities, but for the fact that they will carry the name on to future generations. While Dr. Cheever naturally regretted the absence of his son during his last illness, yet it was not unexpected, or unprovided for. He urged him to take the position as head of the Second Harvard Unit for service in the hospitals in France, realizing that he might never see him again. He regarded this action of his son as his final contribution to the great struggle for humanity now being waged in Europe. He often spoke of his gratification in the fact that a representative of his family was "doing his bit" in relieving the sufferings of the soldiers in France.

The increasing disability incident to his age was a sore trial to Dr. Cheever, who had been so active, but he bore it in silence and preserved his usual calm exterior to the last. For three or four years he had been unable to do much reading by reason of cataracts, and was, therefore, obliged to depend upon his secretary or some member of the family to supply the deficiency. He had also been warned by certain symptoms that his heart was not doing its work with its usual efficiency. He was advised to lay aside his favorite cornob pipe. Notwithstanding these infirmities, however, he was able to be out and about until near the end of his life. His last days were reasonably free from suffering.



About a week before his death he was attacked with the "old man's friend," pleuropneumonia, and went to bed for the last time. He received the most attentive and skilful care of Dr. Henry Jackson, the son of his old teacher and friend, Dr. J. B. S. Jackson, for whom he always entertained the highest esteem, not only for his mental acumen, but also for his kind heart and strict integrity; a fine type of the old school physician.

Dr. Cheever conferred freely with his physician from day to day as to his condition, fully realizing the situation and accepting it calmly and philosophically, as we should expect him to do. His habitual consideration for the welfare of others never failed him. A couple of hours before he passed away he said to his daughter, "How is your mother bearing up under this? I don't want you to leave her today." Although very weak, he then drew a check for prospective expenses and told his daughter to open the safe where she would find the pay envelopes for all the family employees properly sealed and labelled. "Pay those bills and come back and tell me when it is done." Soon after being told that his instructions had been carried out and realizing that he had attended to every possible detail, he closed his eyes in his last sleep, and all was over. In the language of his physician, "he died a king." He was Dr. Cheever to the last moment of his life; complete master of himself and of all his faculties. He died, as he had lived, quietly, bravely and thoughtful of others to the last. It was consistent with his life. It was ideal.

Few lives of eighty-four years are so sensible, so replete with good work, so completely under control, so well rounded out in all the essentials of true manhood, as was Dr. Cheever's. His sterling character, his high ideals, his strict integrity, his keen intellect, his sound judgment, his devotion to duty and his loyalty to his profession, all justify our highest appreciation. His career may well serve as an example, an inspiration to future generations of physicians.

Well done, good and faithful servant. You have fought the good fight; you have finished the course; you have solved the great mystery of the hereafter. We shall never see your like again, but your life's work will be admired and your memory will be revered by those who appreciate high character, noble service and all the sterling attributes that make for the development of the finest type of men, the upright citizen, the honorable, dependable physician.

## II.

By J. COLLINS WARREN, M.D., BOSTON.

My earliest recollections of Dr. Cheever date back to a period long before I had even thought of studying medicine. My father had gone to Portsmouth, N. H., to see a case in consultation

with the elder Cheever and had taken me with him. While the two surgeons were absent on their professional duties, I, a boy ten years of age, was entrusted to the care of the son, a young man who had just returned from Harvard where he had recently graduated. I can still recall distinctly the impression made upon me at that time. A tall and slender youth with quiet and sympathetic demeanor, he was conscientiously carrying out his father's orders to entertain the child in a suitable manner, in which effort he was eminently successful. Although no special exertions were manifest on his part to make himself agreeable, the time passed for me only too rapidly.

On the return of the doctors, the dutiful son was asked to array himself in a costume, in which he was to appear that evening at some social or public function. Young David disappeared and soon returned in the dress of a youthful Puritan. There still stands before me in my mind's eye the figure of a grave and dignified young graduate, fresh from four years of college life, the centre of an admiring circle amiably adapting himself once more to old family surroundings.

Since the curtain of memory first slowly fell on this little episode, the recollection of it has frequently come back to me in later years as a sort of prologue to the future relations—an entente cordiale—which were happily preserved in after life between teacher and pupil, and to the rôle which this representative of fine old New England stock was to play in the interesting medical drama, soon to be placed upon the stage.

Ten years and more had elapsed before I again came in contact with Dr. Cheever, now the full-fledged practitioner and teacher in the Medical School. As demonstrator of anatomy, he had charge of the personal instruction of the students under the supervision of Oliver Wendell Holmes. Having been given an opportunity to assist in the preparation of the dissection for the daily lecture, I enjoyed the privilege of coming into close contact both with the professor and his assistant. Of Holmes, Cheever says: "Wit, gentleness, keenness of intellect made Dr. Holmes a delightful master." Contrasted with the breezy ways of his senior were the quiet and business-like methods of the taciturn young man.

The holder of the office of demonstrator of anatomy had no sinecure in those days. The medical student was not of the type to which teachers of today are accustomed, but it proved an uphill job even for them to disturb the unruffled demeanor of their teacher.

I recall one occasion when the demonstrator's equanimity was put to a severe test. The dissecting room was in a semi-detached one-story structure, forming a low ell to the main building. It was lighted only from above. One quiet evening, while a section of the class was attending a demonstration by Dr. Cheever, a missile thrown by an unseen foe came crashing through



the brightly shining skylight. There was a moment's pause, no one daring to disturb the decorum of one of Cheever's exercises. I glanced with much interest at our instructor to see what effect this extra-mural demonstration would have upon him. After one look at the dilapidated ceiling he turned to the class, and in the words of his dual prototype calmly gave the order: "Up guards and at them!" Needless to add that the class promptly responded to the call, but not before a discreet enemy had been lost in the darkness of the night.

Dr. Cheever was a popular teacher, for though his manner often seemed cold and reserved, there lay beneath a saving sense of humor, so efficacious an antidote in time of tension. There was always a feeling of perfect confidence by the class in the justness of his decisions. (To the close of his career as a teacher, he retained a tender interest in the welfare of his pupils, as is shown in the foundation at the time of his retirement of the Cheever Scholarship,—the first of its kind—for young men entering the Medical School).

After serving eight years as demonstrator he was appointed adjunct Professor of Clinical Surgery in 1868, and this was followed by further promotion to a professorship of clinical surgery in 1875. It is difficult to appreciate at the present time the full meaning of this recognition of his ability as a surgeon and teacher, and of his standing in the profession.

The foundation of the City Hospital had been looked upon with suspicion by the powers that were of that time, and there was certainly no favoritism in the selection of Dr. Cheever to fill a prominent position in the surgical department of the Harvard Medical School. The teaching staff of surgery would not have been complete without him, and so, with no fear or favor, he rose steadily from one position to another, being made Professor of Clinical Surgery in 1875, and finally, upon the retirement of Dr. Bigelow, the head of the department as Professor of Surgery in 1882.

It is interesting in this connection to glance at a list of the subjects which constituted the course of lectures given by the Professor of Surgery in 1888, as shown in a printed list of the winter's course which lies before me. It covers the same ground as that of his predecessor, and is practically a surgery of the systems. Surgery was only just beginning to claim its share of internal medicine, and as new regions were invaded by pioneers from time to time, the teaching of these new chapters of surgery was relegated to the younger members of the department.

There was no one of the surgical staff at the School who could, however, compare with him as a teacher. Dr. Bigelow's personality had always contributed largely to the prestige of the surgical department in the School, and his course of lectures was always characteristically punctuated by one or two of the interesting or

brilliant episodes, with which that distinguished teacher knew only too well how to garnish them. But Cheever's lectures were marked by a clock-work-like precision, by which the ground laid out beforehand was covered systematically from beginning to end. A cool and clear head, a reposeful manner showing the speaker to be perfectly at his ease, a well modulated voice and simplicity of diction (qualities alas, but too rare in lecturers of our profession) combined to enable Dr. Cheever to hold the attention of his class from start to finish.

Lasting proof in the accuracy of this statement is given in that admirable book containing his published course of lectures, which were taken down verbatim by the stenographer and printed subsequently almost as a phonographic record.

Needless to say that the attendance at Dr. Cheever's lectures was always a large one, and that great regret was manifested by the students at his retirement, which occurred in 1893. For many years after this, as emeritus professor, he was invited to give a few lectures on subjects of his own choosing to gratify succeeding classes, who had been disappointed in not being able to count themselves his pupils.

This quality as a teacher enabled him to shine conspicuously at the bedside in clinical instruction. I well recall certain Sunday morning visits at the City Hospital, which I had the privilege of attending after entering upon the practice of my profession. These were models of what such visits should be. No extraneous matter was injected into these talks. There was no wandering from the point which each particular case illustrated, and the story and its moral were told in the fewest possible words, the patient and not the doctor being always kept in evidence.

As I have already intimated, our relation—first that of pupil and teacher, and later of assistant on the teaching staff—were always regarded by me as leaving nothing to be desired. The elder man always took a sympathetic interest in his junior's welfare. No occasion calling for a word of encouragement or congratulation was ever passed unnoticed; and if criticism was necessary, it was always skilfully concealed under the guise of a fatherly suggestion.

I have often wondered whether the current of academic waters flowed as smoothly in other departments of the University as they did in ours while he was chief. Perhaps it was because his depth of character brought a serenity with it which permeated the whole staff, one and all of whom were glad to acknowledge him as their leader.

Through all the period which I have attempted to cover in the course of this personal sketch, the estimate of the man which had impressed itself so forcibly on the child, still seemed to hold true. In whatever rôle he might appear in after life, either as the bold surgeon, or the unflinching leader in a good cause, or the quiet



gentleman in somber clothing on his daily rounds, I seemed still to see the garb which was so typical of his ancestry and his character. And when, at the recent Convocation of the American College of Surgeons, the honorary degree of the college was conferred upon him, I saw him for the last time in the robe of the order, he seemed to me to have come into his own again. The somber folds of the academic gown seemed to serve as a fitting setting to the grave and intellectual features of the man and while, during a pause in the proceedings arranged to allow him to retire, he passed slowly down the aisle, leaning upon a proffered arm, his assembled colleagues rose as one man to do him honor as a recognized leader in their chosen profession.

### JAMES CLARKE WHITE, M.D.

#### I.

By ABNER POST, M.D., BOSTON.

DR. WHITE was so well known as a dermatologist, that comparatively few know the varied activities of his earlier life. He, somewhat unconsciously, fitted himself for the study of medicine during his boyhood and college years. It is very striking that he devoted himself of his own volition, before he even knew what his future life would be, to those preparatory studies which are now required of students entering upon the study of medicine. In his undergraduate diary, he wrote, at the end of his junior year: "I have done much work outside the curriculum in natural history—in botany and ornithology especially—fascinating studies under such teachers as Gray and Wyman." During vacations, he shot and stuffed birds for the college Natural History Society. He refers in his diary to Webster's post-mortem and to walks of his class with Agassiz; of being excused from recitation at the advice of the president to attend an auction of stuffed birds. On May 15, 1853, the latter half of his senior year, he wrote in his diary: "There came to me this afternoon in church the sudden conviction that I would choose medicine as my life work."

In the first two years of his medical course, he spent much time in the study of chemistry. Professor Cooke fitted up a small laboratory for students and in this laboratory, Dr. White gained "a considerable knowledge," as he said, "in analytical and physiological chemistry." He analyzed the Warren collection of urinary calculi and wrote an essay based on that work which received the Boylston Society's prize.

In 1855, he was appointed house pupil at the Massachusetts General Hospital, on the medical side, with Drs. J. B. S. Jackson, D. Humphrey Storer and Henry I. Bowditch as his visiting

physicians. George S. Hyde was the other medical, and Lucius Manlius Sargent, Jr., and Alfred Hosmer, the two surgical house pupils.

At the end of this year's hospital service, he returned to the chemical laboratory for two months and in August sailed for study in Europe, going to Vienna instead of Paris, on the advice of Professor Calvin Ellis. In Vienna, he devoted himself to general medicine, but especially to the study of skin diseases, as he says, "perhaps because I felt that I had more to learn in this than in other branches of medicine and that facilities for their study were so extraordinary, rather than with any intention of making it an exclusive field of practice."

A description of Hebra, which he made some years later, shows the impression that great teacher made upon him: "There (in Vienna) they found a man teaching skin diseases as they had never been taught before, with unlimited means of clinical illustration, with the keenest eyes for observation, with an unbounded amount of information drawn from many years of experience, with a self-restraint which no desire for premature fame could tempt into hasty publication, and with a sound and logical mind, the chief of the German school of dermatology—Professor Hebra. Under his personal tuition, they were taught to study diseases of the skin by the simple methods of observation which the naturalist employs upon objects of nature."

The memory of those Vienna days was kept alive by a club of six men who had studied there together.—Drs. Hay, H. K. Oliver, B. J. Jeffries, Hasket Derby, F. B. Sprague and J. C. White. They dined together regularly and a photograph of the group occupied a prominent place on Dr. White's office wall.

On his return to Boston, he entered upon general practice with an office in Hotel Pelham, very recently demolished, and a little later after his marriage, in Park Square.

In 1858, he was appointed Instructor in Chemistry, and in 1866 Adjunct Professor, and while holding that office he made examinations for the Government in all capital cases, and gave his testimony with such impartiality that he was seldom cross-examined.

In 1871, on the resignation of Professor Bacon from the Chair of Chemistry, Dr. White declined further advancement as a teacher in that branch. He had already been appointed visiting physician at the Massachusetts General Hospital and his growing practice, especially in skin diseases, demanded the greater part of his time. That same year, a dermatological department was established at the hospital under his charge and he was appointed Professor of Dermatology in the Harvard School—a chair especially established for him and which he held until 1902.

To his value as a teacher, most of us here can bear witness; of the regard in which he was held by his dermatological associates, one cannot do better than quote a few paragraphs from



an obituary notice in the *Journal of Dermatology*:

"The influence of the pioneers in dermatology must not be underestimated, and foremost among them stands the figure of James Clarke White. Beginning at a time when specialties were unrecognized and repudiated, or at most, grudgingly acknowledged, he devoted himself to the task of showing that progress and the best results are to be obtained by concentration of energy and purpose along well-defined lines. This course required courage and pertinacity, with both of which qualities he was highly endowed. If the path of the specialist seems easy and natural nowadays, it must be remembered that those who mapped it out lived under far different conditions. The prejudices that had to be encountered are more than once touched upon by Dr. White in his reminiscences. But he was by nature truthful, fearless, and, like all strong characters, confident of himself and of his cause, and ready to defend it before any tribunal. These very qualities, which exposed him, perhaps, to the occasional criticism of being dogmatic or controversial, were of inestimable value to the causes for which he labored. His influence at the meetings of the American Dermatological Association was always exerted in the direction of high progress, and his dignified example will be remembered with approbation by all his colleagues, even by those who were sometimes inclined to resent his uncompromising adherence to his principles."

Dr. White took his duties as Professor in the Medical School very seriously. The world owes him a debt of gratitude for his part in the reform, or better, the improvement of medical education. When he first became a teacher, the requirements for a degree were three years of nominal study with two courses of lectures, and medical schools were dependent upon the fees from these lecture courses for their existence. A small proportion of students supplemented these requirements by summer courses, but the actual requirements for a degree were very low, and there was a very genuine, though by no means universal, desire, in medical circles for a higher standard. Fruitless attempts had been made to unite the medical schools of the country in a combined effort to this effect, but in the absence of a central authority, they were unable to reconcile their varied ideas—and schools were obliged to act individually. If not the first, Harvard was among the first absolutely to reorganize its curriculum, but not without dissension among its faculty. It required faith in the future to believe that it was possible for an unendowed school so to raise its standards as to drive away more than half its scholars and still live. Into that reform, Dr. White threw his whole soul.

He was at that time editor of THE BOSTON MEDICAL AND SURGICAL JOURNAL and used the editorial pages to favor the reforms he so ardently wished.

It was the custom to open the winter's lecture course by an address from some one of the Faculty. This duty having fallen to Dr. White, he utilized the opportunity to make another plea for better instruction for students, and again, as anniversary orator of the Massachusetts Medical Society, he made to the general profession a similar plea. It is impossible to distribute properly the credit of this movement, but no one was more persistent in its advocacy than Dr. White. Neither is it easy, at this late day, to understand that it required courage. The improvement appears to us so logical and so necessary that it seems unbelievable that any opposition should have existed. The great hold which it took upon his life is shown by the great space devoted to it in his "Sketches of My Life."

It was a very natural sequence of Dr. White's interest in natural history that he should become a member of the Boston Society of Natural History. He served as its curator of comparative anatomy for ten years, from 1858 to 1868, and was a very active and efficient one. He secured the bodies and mounted the skeletons of the animals from an extensive menagerie, which had perished in a conflagration. There is a tradition at the Museum that Professor Agassiz appeared at the menagerie very soon after Dr. White had completed his bargain, and was very much disappointed at his failure to obtain the skeletons for the Museum at Cambridge. At the present time the Boston Museum is planning to limit its activities to the fauna of New England and the skeletons in question are being transferred to the Cambridge Museum, where Agassiz wished to see them. He also arranged a large collection of birds. He was interested in the construction of the present building at the corner of Berkeley and Boylston Streets.

Fifty years ago, the study of natural history was largely confined to physicians. They were the principal founders of the Boston Society of Natural History. Of its seven officers, chosen at its first meeting, six were physicians. Dr. White was also a member of the American Academy of Arts and Sciences when the same men who were prominent in the Natural History Society, discussed Darwin's doctrine of natural selection.

Dr. White had always the good of the profession as a whole at heart. He did much to bring about mutual acquaintance and confidence between its members. In his address as first president of the American Dermatological Association, he said:

"The little differences of opinion, personal jealousies, and even malicious criticisms, which are so apt to occur among physicians, to the



detriment of science, arise largely from mutual misunderstanding and would be far less prevalent if the parties knew each other better." And, twenty years later, in another address, he said: "In that first address I expressed the hope that the dermatologists of this country, who lived widely apart and had been working without meeting each other, some of them for twenty years, would find great advantage in forming a mutual acquaintanceship and comparing and reconciling their individual opinions, often, previously, at unfortunate variance. Certainly we may congratulate ourselves that this most desirable aim has been completely fulfilled; that it is a sincere delight to meet one another at these yearly gatherings; that our respect and esteem for each other has been constantly strengthening during all these years and that we express and criticize our individual observations and beliefs with the utmost frankness without jarring in any measure our bonds of good fellowship."

The same desire to see us a brotherhood of scientific physicians rather than an aggregation of rival practitioners, was manifested among us here in his home. In his "Sketches" he speaks of the many pleasant acquaintances with physicians in all parts of the state, formed during his visits as President of the State Society to the district societies.

In the Massachusetts Medical Society, Dr. White was anniversary chairman, orator and president. He was the first president of the American Dermatological Association and held the same office at its twenty-first annual meeting, but the honor which must have given him the greatest satisfaction was the presidency of the International Dermatological Congress held in New York in 1907.

He was a polished and forceful writer, but many of his writings were on subjects of immediate interest,—addresses and editorials, which played an important part in the questions of the day. They all show evidence of a well-cultivated mind and of high and earnest purpose.

His contributions to dermatological literature were numerous, original and valuable. It is doubtful if he ever failed to contribute something of worth to every meeting of the Dermatological Association.

His book on "Dermatitis Venenata" filled a gap in medical literature. His knowledge of botany and chemistry contributed largely to its value. It illustrates the usefulness to the profession of men with special knowledge in different scientific branches.

In 1914, he published privately and circulated among his friends an autobiography which he entitled "Sketches from My Life," of which mention has already been made. One sees in it the love of natural history and natural science as a guiding force from childhood to old age. It contains his diaries at Cambridge and in the

Medical School. In it he lives over the interesting activities in which his life had been passed and closes with an expression of contentment which must come to few.

No notice of Dr. White could be complete without reference to his personal appearance. He carried himself very erect, his dress was always immaculate, and he gave the impression of absolute cleanliness of body and soul. One could not associate anything common or unclean with his personality. This view of the man adds peculiar interest to a description of his first impression of one of the older of the Viennese professors: "He looked as though he had made a very hasty toilette, had forgotten his collar, and had not made the same use of the Danube as we do of the Cochituate," and it also shows that he was able to appreciate the man in spite of this first impression. His description continues: "The man himself has small, beady eyes beaming with fire and *bonhomie*. A great well of cunning and knowledge of the world lies hid therein. His hands, with which he reads such curious riddles of disease, any lady might envy for their shape."

I cannot close this tribute to Dr. White without an expression of my own affection, and with some hesitation I am going to relate an incident, trifling in itself, but revealing a side of his character unsuspected by those who met him only casually. It was my good fortune to cross the water with him in 1896 and to occupy the same state room—and the courtesy which he displayed can never be forgotten. Never for a moment did he forget my comfort. In particular, I recall one afternoon when I felt obliged to lie still upon the lounge—not quite sick but with a strong preference for a horizontal position and quiet. Three or four times Dr. White came to the room, softly opened his trunk, took up and replaced an article or two, asked if I wanted anything and retired. I could not see that he put anything into the trunk or took anything out. The sole object of his visit was his wish to do anything possible for my comfort and to conceal from me the real reason of his visit.

Dr. White died on January 5, 1916, at the age of 83. He had lived to see the reforms in teaching which he had urged so enthusiastically established, and the school which he loved take the high rank to which he aspired for it. He had seen his chosen specialty given its proper place in the medical curriculum everywhere. He had held all the honors his profession could bestow upon him. He left this world followed by the respect of all and the love of those who had known him.

## II.

By FREDERICK C. SHATTUCK, M.D., BOSTON.

FULL of years, full of honors, highly respected by profession and public alike, after an un-



usually rounded and successful life, James Clarke White has gone to his rest, leaving behind him an example which we very properly, and I trust fitly, emphasize this evening.

He was of Scotch-Irish stock, founders of Londonderry, New Hampshire, some of whom, moving to the Maine coast and mindful of their origin, called their place of settlement Belfast, another important Ulster town. Here, in 1833, our friend was born. One would not suspect that one of his great grandmothers was a Viennese, so characteristically Scotch-Irish were his qualities. It is perhaps well that he was one of a family of seven children, an education in itself. His father was shipbuilder, ship owner, manufacturer, bank president, a leader in all the activities of the town and the country round about. James, fifth child and eldest son, took his A.B. at Harvard in 1853, member of a class prolific in professors, his M.D. in '55, after service as house pupil in the Massachusetts General Hospital. Up to this time Paris had been the Mecca of the aspiring young American man of medicine. White was among the first Americans who broke away from this tradition, encouraged to do so by the suggestion of Calvin Ellis, who had lately visited Vienna, and recognized the advantages offered by that group of remarkable men,—Oppolzer, Skoda, Rokitsansky and Hebra. In this step he showed a characteristic trait, that of doing his own thinking. After a year in Europe, a year which all who knew him are sure was filled with diligent purpose alike in purely professional and in general improvement, he settled in general practice in Boston. In dermatology and medical chemistry he had qualified himself especially. His character, his knowledge, and his readiness to use them fully wherever service could be rendered, met with prompt recognition.

My earliest personal recollections of him go back to the middle '60s, when he was Adjunct Professor of Chemistry. My father was then Dean of the Medical School, and the Faculty meetings were held at his house. After due attention to affairs of state, the physical ravages caused thereby were made good by a simple, stand-up supper of oysters, ice cream and wine. To these I was sometimes admitted, and did my best to save waste of food. My most vivid recollection of these meetings is Dr. White, who was always very kind to and considerate of the boy of the house. His manly, clear-complexioned face, his erect form, the conspicuous neatness of his well-cut clothes are all stamped in memory.

After I began to study medicine in '68 his teaching in chemistry and dermatology, and ward visits with him in the Massachusetts General Hospital, to which he was appointed Visiting Physician in 1871, occupy cells in my cerebral cortex which are still in commission. Soon after this came the parting of the ways.

As thorough a man as he could not slur work, and he had to reconcile or decide between the rival claims of general practice, medical chem-

istry, and dermatology. As a medico-legal expert he made it a rule to appear only for the Government, a practice which enhanced respect for the impartiality of his evidence. To all, no one man, even fifty years ago, could do justice. He chose dermatology, of which he was appointed Professor in 1871, and cut himself off from all other practice. It required great courage in those days to specialize in dermatology; indeed, in anything except ophthalmology. But courage is a quality of which Dr. White had, at least, his share, and his integrity of character was so well known that all understood there was no sham in his adoption of a specialty. It seems a pity that so many present day specialists start as such, instead of growing into specialism, as did White. Perhaps it is unavoidable, so intensively and extensively has knowledge opened up, above all in the last quarter of a century. The body is one, although its parts are many. General practice may be compared with the low power of the microscope. Dr. Owen Wister, of Philadelphia, remarked to me many years ago that "it takes a mighty big man to be a specialist." Dr. White was not what his great teacher, Hebra, used to call "a specialist by the grace of God." His specialism was based on a wide, general experience. On his work and eminence as a specialist I shall not dwell, nor on the very active part he played in medical education and its reform.

Behind the specialist is the physician, behind the physician the man. Dr. White was a virile, a very real man, and it is of him as such that I shall mainly speak. He knew how to play, as well as how to work. At one time he was a diligent frequenter of baseball matches. Always a lover of nature, he delighted in the mountains, the sea, the clouds. At one time no member of the Boston Society of Natural History was more active than he. Since my intimacy with him began, now some thirty years ago, it seems to me that birds and plants especially appealed to him. Every summer he kept a list of birds seen. During a visit to me in the Adirondaeks, he sought for and listed all plants bearing berries. He cared more for the beauty of the plant, its flower and fruit, than for intimate structure. I cannot remember ever seeing him use a pocket lens in the woods or fields. Of china he was fond and knew much. Here again his nature asserted itself, his hatred of sloppiness. His interest ran mainly to European and American china, recognizing that the whole field cannot be ploughed by a busy professional man.

He well knew what good food is, how to select and how to prepare it. I should say he was a bit of a gourmet, were I sure that I should be fully understood. His gastronomic tastes were catholic, but there were four things he couldn't, or wouldn't eat. Clams, melons, and pineapples, he eschewed because they disagreed with him. The pig to him was an unclean beast, and he would have none of him in any form. His baked beans, to which he was loyal, were married to



fat beef. Only a few years ago he was to dine with other friends at my house. Luckily I found out in time that all four of his taboos were on the proposed menu. He was a judge of wine, of which he had a careful and wisely selected cellar, much enjoying a good glass with friends. Cocktails and tobacco had no charms for him. When he took alcohol, he took it like a gentleman, in the form of wine, and with his dinner. He was a wide reader, with system in that, as in other things. He rarely slept after six, and got in an hour's reading before rising. Of the First Church he was an active member, serving on the Standing Committee for some time as Chairman, and on various other committees.

The society of his friends was a delight to him. He was always courteous and considerate of others, perhaps not quick to give his friendship, but once given it was firm as a rock. His social talents had wider scope as his time was freed from the Medical School, and the Hospital, and, finally, from private practice. Some of the leisure thus won resulted in his interesting "Sketches of My Life," and in his sketch of the Clarke-White family.

The last years of his life he passed the months of June to October at Islesboro in Penobscot Bay. His white house was on the crest of a ridge one hundred feet above the water, and contained collections of books, china, furniture, and pictures, which gave him great enjoyment, alike in collecting and in owning. The eupolia, to which he liked to lead the way, commanded both east and west bays, and more than twenty towns, among them Belfast, his birthplace, some ten miles away. On his west porch he passed much time, delighting in the ever-changing views of the Camden Hills, and the activities of Gilkey Harbor. No yacht entered or left unnoted by him. Many friends will cherish many memories of this porch, and regret that memories alone remain for them.

Of sentiment he rarely talked, but he had it abundantly.

Some we call good are so negatively, rather than positively. Not so Dr. White. Virile, fearless, aggressive, he was a good fighting man, good man of medicine, good citizen, good friend. An unusual degree of these by no means synonymous forms of goodness was happily and rarely blended in him.

He was a knight, *sans peur et sans reproche*. In life he stood for all that was best. Is there any better preparation for death, anything which one of us could more wish said of him? Let us honor him by striving to follow his example.

#### REMARKS.

DR. SPRAGUE: I wish to add a few words of a personal nature to the tribute to Dr. White, as coming from an old friend and contemporary. Dr. White and I were fellow students

in the Medical School, where we had a pleasant acquaintance, and afterwards met in Vienna, in 1856, where we roomed together for the greater part of a year. At that time Europe was not the familiar ground which it has since become to the American traveler and student, and Vienna seemed especially remote and strange, in truth a far country. This tended to increase our intimacy, an intimacy that has existed and thrived through all these succeeding years, although our paths have, in many respects, been in different directions. Dr. White at that time showed the qualities that in later life carried him so far. He had untiring energy, great industry, was a keen observer, and possessed of excellent judgment. He was always self-reliant, and had a strong personality that was evident to everyone who came in contact with him. He had a most retentive and accurate memory, and was often called upon by his intimates to refresh their recollections. He thought clearly and wrote exceedingly well, with a clearness and conciseness difficult to surpass. He was a keen critic, but never indulged in a carping spirit. He was always fair and above-board, and he had a generous admiration for talent shown by others or good work done by them in any direction. He had an independence that made him more willing to confer a benefit than to receive one. He had high standards and lived up to them. In his death his associates have lost a true friend, a genial companion, and a sterling gentleman.

### Original Articles.

#### EPIDEMIC POLIOMYELITIS. THE SYMPTOMATOLOGY AND DIAGNOSIS IN THE ACUTE STAGES.\*

BY FRANCIS R. FRASER, M.D., NEW YORK.

[From the Medical Clinic, Presbyterian Hospital, Columbia University, New York.]

THE evidence at present available on the manner of conveyance of the virus of acute poliomyelitis points to the importance of personal communication of the infection.<sup>1</sup>

Acute cases, recovered cases, mild cases, abortive cases and human contacts are all capable of conveying the infection. Any methods of isolation and quarantine that may be deemed necessary as preventative measures require for their efficient administration that all cases, including the abortive forms, should be recognized early.

The diagnosis of acute poliomyelitis is not of great difficulty after paralysis sets in, but is of

\* An abstract from lectures delivered to the medical profession in the State of Vermont during the summer of 1915, at the request of the State Board of Health.



extreme difficulty in the preparalytic period and in mild and abortive cases. The acute stages may be divided into four periods. There is first a period of incubation, when no symptoms are present and when the patient is apparently perfectly well. The length of the incubation period is difficult to ascertain, largely because of the difficulty of determining the source and time of infection, but has been variously computed to be from two to ten days, and may be as long as three weeks. A study of the experimental disease in monkeys, which simulates the disease in human beings very closely, shows that in monkeys there is an incubation period varying from three to forty-six days or longer. The second or preparalytic stage is marked by a sudden onset. From the statistics of the Vermont epidemic of 1914, it is found that of two hundred and eighty-four cases, one hundred and seventy gave a history of excellent health before this onset; in ninety-seven the health is recorded as good, and in eighteen as poor. The preparalytic period may be entirely absent, and this is commonly seen in the sporadic cases, but in epidemics it is almost always present. In one hundred and twelve cases admitted to the Hospital of the Rockefeller Institute during the years 1911-1913, in whom the time of onset of the preparalytic period could be definitely ascertained, the average duration of this period was over two days. The longest period in this series was fifteen days, although in a few cases the preparalytic and general symptoms have disappeared entirely for a few days, only to return with paralysis. The third period follows the second immediately, and is characterized by paralysis or weakness of muscles, in addition to the symptoms that characterize the earlier period. The paralysis may be developed suddenly without further spread, or the further involvement of muscles may continue for an indefinite period, usually for a few days only, and seldom for more than ten days. In the fourth period no further spread takes place; the patient's general symptoms are still present but are subsiding. This period occasionally ends sharply, as if by crisis, but is more often prolonged, the symptoms disappearing gradually. It may be many weeks before the pain and tenderness and other acute symptoms disappear. With this period the acute stages may be considered to end, and it is then the results of the disease that have to be dealt with.

The lack of definition of these periods is to be expected since they are defined by symptoms which are only the outward evidence of the disease process that is taking place in the body generally, and in the central nervous system in particular.

**Incidence.**—All classes of the community appear to be equally affected, and although the disease is commonest under the age of twenty, there does not seem to be any limit to the age

of the persons attacked. Two hundred and ninety cases in Vermont in 1914, grouped in age periods, show:

Under 1 year.....	0 cases
Between 1 and 2 years.....	37 "
Between 2 and 5 years.....	88 "
Between 5 and 10 years.....	75 "
Between 10 and 20 years.....	63 "
Over 20 years.....	27 "

That a history of excellent health immediately previous to the attack is the rule, has already been pointed out. Seasonal incidence has been the subject of much statistical study and, as in most epidemics in this country, so in the Vermont epidemic of 1914, the incidence was greatest during August.

**Symptomatology.**—1. Preparalytic and General. When the case is first seen by a physician the parents, as a rule, state that there was a sudden onset of feverishness, with drowsiness, general weakness, loss of appetite or vomiting, and perhaps irritability and restlessness. Frequently such a condition persists for two or three days before the attendants realize that something more than a mild disturbance of the digestion is present.

(a) Fever is always present at the onset in the epidemic cases. Temperatures as high as 104 and 105 are noted at the onset and in a few cases before death, but it is more usual to find temperatures of 101 to 103 swinging slightly, and gradually subsiding in the course of a few days. It is not unusual to find readings of 100° for many weeks after the acute attack is over and when recovery is well advanced. In a few cases, generally those in which the symptoms are indicative of lesions in the upper part of the central nervous system, a continuous fever of 103 or 104 is seen for three or four days, ending sharply in a crisis.

(b) The pulse rate follows the temperature, and any pronounced departure from this rule should lead to a search for some cause other than poliomyelitis.

(c) Gastro-intestinal disturbances are usually present and may predominate in the first few days. Loss of appetite is always present in the febrile stages, and the illness may be ushered in by vomiting. Profuse diarrhea is rare, and constipation is more often present and may be marked. The vomiting rarely persists after the first two or three days. Abdominal tenderness is often seen and is part of a generalized tenderness of muscles. This is especially the case where the abdominal muscles are paralyzed and, as with the paralysis, the tenderness may be localized to a part of the abdominal wall only.

(d) Preparalytic symptoms referable to the respiratory tract have been prevalent in a few epidemics, but this is unusual. It is not uncommon to find slight catarrh of the upper passages, and frequently the tonsils and pharynx have a slightly reddened and congested ap-



pearance. An acute tonsillitis and the formation of a membrane are so seldom seen that their presence would suggest another diagnosis. In cases where the pharyngeal muscles are paralyzed mucus and food collect in the pharynx, and by causing great distress may distract attention from the real cause of the condition. When paralysis appears, the respiratory system acquires a peculiar importance that will be discussed later.

(c) Frequently the first symptom to attract attention is a heaviness and drowsiness. In cases severely infected the patient appears to be in coma, but more frequently there is simply a desire to be left alone and a disinclination to play or to take part in activities of any nature. There is, however, no mental dulness, for when spoken to or aroused there is brightness and mental activity that is surprising. In fatal cases this mental alertness to the very end is a picture that is not readily forgotten when once seen.

(f) Accompanying this drowsiness there is an irritability, when roused, that is in striking contrast to the heaviness seen when the patient is left undisturbed. The child objects to any examination or handling, and the doctor is in more disfavor with his patient when dealing with acute poliomyelitis than with almost any other condition. This child may be ever so good-tempered and tolerant with strangers as a rule, but when suffering from acute poliomyelitis, the disposition is very constantly described by the parents as "cranky." With this mental irritability there is a physical restlessness. Sleep is broken and there is a constant tossing and moving from side to side. Delirium and convulsions are rare.

(g) Frequently the whole body jerks from time to time, but there are also seen sharp single jerking movements of a part of the body—of one limb or of one side of the face—or of several parts. It is noticed that the parts that show such jerking movements are frequently the parts that later become paralyzed. Such jerking movements may be due to irritation of the anterior horn cells before the cells are so damaged as to cause paralysis of the part.

(h) A diffuse generalized sweating is commonly seen in the very severe cases, and may continue both day and night for many weeks after convalescence is established. It is more profuse at night in such cases. As a rule, when present it is only during the febrile period. Less common is a localized sweating seen in a part that later becomes paralyzed. This phenomenon may be related to the jerking movements described above and to the association in the anterior horns of the gray matter of the cord of the motor cells and the cells governing the sweat functions.<sup>2</sup>

(i) In the early period before definite paralyzes are seen, there is apparently a general weakness of the musculature of the whole

body. When a patient recovers from the acute stage in a few days with little paralysis, the strength of the unaffected muscles is in marked contrast to the apparent weakness of the same muscle in the febrile period. It is difficult to estimate how much of this is due to lack of effort on the part of the patient, but this weakness is more marked than in other conditions with a similar degree of fever.

(j) Unlike other infectious diseases of childhood, acute poliomyelitis is accompanied by diffuse pain and tenderness. The child objects to being handled largely because of pain. There may be hyperesthesia of the skin, so that the lightest touch causes pain. In other cases, tenderness is not elicited until pressure is exerted on the deeper structures, especially the muscle masses. There is still a third degree of tenderness, when no pain is elicited until the part is moved, when stretching of the muscles, tendons and articular structures causes pain. The pain may be generalized throughout the body, or, as is usually the case, where passive movement is required to elicit it, it is present only in a part that is paralyzed or about to be paralyzed. Since the pressure of the bed or the attitude of the patient causes pressure on deep structures or stretches tendons and ligaments, it is difficult to ascertain that true spontaneous pain is present. Sometimes the most careful adjustment of a part to avoid pressure or tension fails to relieve the pain, even in older patients, who can cooperate so that the presence of spontaneous pain, as distinct from tenderness, appears to be demonstrated. Older patients who are able to analyze their symptoms, commonly complain of severe headache, and this may be the earliest symptom. The pain in such a case is usually not localized to any particular portion of the head.

(k) Pain in the back of the neck and in the back is an important symptom. This may be spontaneous, but is more often seen only on attempting antero-flexion of the neck and back. To prevent such flexion the muscles of the neck and back are held contracted and give the stiffness that is so characteristic and that early in the disease is suggestive of some lesion of the meninges or central nervous system. Opisthotonos may be present, but this degree of retraction is rare. The patient prefers to lie on one side so that the head may be held tilted slightly backwards, or on his back with a pillow beneath the shoulders so that the head falls back. The stiffness may not be noticeable until antero-flexion is attempted, when pain is complained of and the protective muscular contraction becomes evident. When the posterior muscles of the neck and back are paralyzed this important sign disappears. Kernig's sign is not, as a rule, present.

11. Spinal Fluid. The early pathological findings include congestion of the vessels of the meninges and a perivascular cell prolifera-



tion. The earlier clinical findings include stiffness of the neck and back and a moderate degree of retraction. In these early stages of the disease there is a meningitis. As might be expected, then, there are changes in the spinal fluid. Although the changes are not characteristic of this disease alone, lumbar puncture and examination of the spinal fluid are helpful in the diagnosis from many other conditions that show similar early signs and symptoms, and also in differentiating the disease from other types of meningitis. The fluid, though apparently increased in quantity, is not, as a rule, at greatly increased pressure, but may occasionally spurt out as in tuberculous meningitis. A slight opalescence and occasional flakes of fibrin have been described. The cells are increased in number, and there is an increase in the globulin content. Cell counts of over 1000 per c.mm. are found but they are rare, and counts of under 100 are more common. During the first few days polymorphonuclear cells and cells with irregular nuclei may be numerous, but after the first week the increase is due almost entirely to cells of the lymphocytic type. The globulin increase is found in half the fluids examined during the first week, and the proportion showing this abnormality increases to the third week.

In the first week after the appearance of the first symptom, nearly all the fluids show abnormalities in cell count, of globulin content, or both; in the fourth week about 50% are abnormal; and after the fourth week the proportion falls off very rapidly. The fluid does not clot and is sterile, and no organisms can be found in the centrifuged deposit. The changes in the spinal fluid seem to be independent of the onset of paralysis.<sup>2,4</sup>

III. Blood. The examination of the blood does not help to a positive diagnosis, as there is no change in the number of red cells, while the number of white cells is within the limits of normal variations. A slight increase in the proportion of polymorphonuclear cells may be seen with similar diminution in the number of lymphocytes.<sup>4</sup> A blood count is of value in that any great departure from the normal would indicate a search for some cause other than poliomyelitis.

IV. Disturbances of Motor System. After a variable period of preparalytic symptoms, paralysis is seen, and the diagnosis is then greatly simplified. The pathological lesions may be very diffuse or may be localized. The paralysis may involve almost all the body musculature or may be limited to a muscle group or a muscle. The lesion may be severe, producing a permanent complete paralysis of the affected muscles, or may be mild, causing a partial paralysis or only a temporary weakness. A most thorough examination is, therefore, necessary, and the strength of every muscle must be tested. Changes may take place rapidly and in the course of a few minutes, and frequent examina-

tions may be necessary to establish a diagnosis and to determine the prognosis. The most characteristic lesion of the motor system is an involvement of the anterior horn cells, resulting in a flaccid paralysis of the corresponding muscles. The lesion may, however, be in the higher parts of the cord or in the brain. A spastic condition would then result, and this is frequently seen, though usually as a transient condition during the period of advancing paralysis. The centres in the medulla oblongata are also frequently involved, giving bulbar paralysis. The irregularity of the distribution of the muscles involved is very characteristic of the paralysis of poliomyelitis. Hemiplegias and paraplegias are not common, and simple monoplegias would probably be considerably rarer than statistics show if some instrumental method of examination of the other muscles of the body were employed.<sup>5</sup> Even with the crude clinical examinations so far employed all the muscle groups of a limb are seldom equally involved. Weakness of a muscle of the eyeball on one side or a slight ptosis are not infrequent, and involvement of the muscles of facial expression was found in a third of the cases in one series. Seldom are the facial muscles on both sides paralyzed, and it is usual to find either the upper or the lower parts of the facial musculature only involved. The tongue, the palate, and the pharyngeal muscles must also be examined. The muscles of the neck and back and of the abdominal wall are important, as supporting apparatus may be necessary to prevent deformities if these groups are involved. Of greatest consequence to the patient is the condition of the respiratory muscles. Fatal cases invariably result from paralysis of the respiratory muscles. With the diaphragm alone, or with the serratus muscles alone, the respiratory movements may be carried out efficiently, but when both are paralyzed death results. From the first sign of weakness the spread to paralysis of both groups is sometimes very rapid, so that a careful examination is of the greatest importance. An estimate of the efficiency of the serratus muscles may be obtained by interfering with movements of the diaphragm by firm pressure on the abdomen, and of the diaphragm by the prevention of the expansion of the thorax by pressure there. Incontinence and retention of urine are both seen, and a flaccid condition of the anal sphincter is reported. Much information as to the condition of muscles can be gained from an inspection of the attitude of the patients as a whole, and of the limbs and by testing the tone of the muscles on passive movements. Isolated active movements are difficult to elicit in infants, and the coöperation of the mother is of the utmost value in completing a systematic examination.

V. Disturbances of Reflexes. Short of demonstrable disturbances in the functions of the muscles, disturbances in the deep reflexes are



found. In the early stages and in mild cases these may be the only indications of lesions of the motor mechanism, so that a careful examination of the reflexes is helpful. As in the case of actual paralysis, it is the asymmetry of the disturbances that is characteristic. Reflexes may be exaggerated one day and absent the next, with demonstrable paralysis not appearing until the day following; or, the reflexes may gradually be lost without any demonstrable paralysis whatever developing. Exaggerated reflexes in one part and absent reflexes in another may be present at the same time. Valuable information may also be obtained by the examination of the superficial reflexes.

VI. Disturbances of the Sensory System. It has been demonstrated that the earliest and most constant lesion in the experimental disease is found in the posterior root ganglia.<sup>6</sup> These rarely go on to complete destruction of the ganglion cells, so that, although permanent disturbances of sensation are not to be invariably expected, temporary disturbances during the stages of congestion and edema and cell infiltration may be expected. These interstitial changes have been seen in the preparalytic stages in monkeys. The pain and hyperesthesia may be due to these histological changes. Because of the usual age of the patients and their general condition in the acute stages, an accurate examination of sensations is impracticable by the ordinary clinical methods. Definite impairment of sensation has been demonstrated in a few instances in older patients. It is possible that many of the cases that have been called "abortive" would show changes if more accurate methods of estimating muscle power and sensations were available. It is probable that many cases of doubtful diagnosis could be cleared up by such examinations.

*Abortive Cases.* It is difficult for medical men who have not had opportunities to observe acute epidemic cases of poliomyelitis, to believe in the presence of abortive forms. It was first pointed out by Wickman<sup>7</sup> that abortive cases form a large proportion of all cases in an epidemic, and it has been suggested that they may even outnumber the paralyzed cases. It is of importance then, in taking any steps to prevent spread by quarantine, that the mild and abortive cases be recognized. The evidence in support of the occurrence of such cases is considerable, but owing to the nature of the condition it has not been possible to demonstrate the characteristic pathological lesions in a human case. The occurrence of every grade of severity, from the totally paralyzed rapidly fatal cases to the rapidly recovering cases, with at no time more than the mildest degree of weakness in one muscle, suggests that still milder cases, with general or perhaps meningeal symptoms only, must also occur. In most epidemics that have been carefully observed it has been pointed out that mild degrees of fever

and gastro-intestinal disturbances occurred to a greater extent than usual among the unaffected members of the community. In 1894 Dr. C. S. Caverly<sup>8</sup> noted that during the epidemic of that year in Vermont, the infectious diseases of children were accompanied by nervous disturbances. Kling, Wernsted and Petersen<sup>9</sup> demonstrated the presence of the virus of poliomyelitis in the throat washings of such cases. Changes typical of poliomyelitis have been demonstrated in the spinal fluid of such cases. Monkeys have been inoculated with small doses of the virus of poliomyelitis, and after showing the prodromal symptoms, have recovered, and their immunity demonstrated by their resistance to a second inoculation.<sup>10</sup> Such cases are characterized by the preparalytic and general symptoms described above. They are usually mild and ambulant, but may show the pain and hyperesthesia and meningitic symptoms. If such a condition is suspected, lumbar puncture should be performed.

*Diagnosis.* In the preparalytic period and in abortive cases the diagnosis depends, to a great extent, on the presence of an epidemic and association with other cases. Under these circumstances, a history of sudden onset with fever, gastro-intestinal symptoms and perhaps pain, would indicate a careful examination for signs of stiffness of the neck and back. If any suspicion of a meningitic lesion is entertained, lumbar puncture must be performed, when the condition of the spinal fluid will clear the diagnosis in most cases. The differentiation from a gastro-intestinal upset is most difficult. The onset may be quite sudden, the fever and general condition identical, and there is frequently objection to being handled and to flexion of neck and back. The spinal fluid is, however, normal; diarrhea is more usual than constipation, and the vomiting more persistent. The other common infectious diseases commence similarly, but in them the pain and hyperesthesia is usually absent, the spinal fluid is probably normal, and a characteristic rash develops. Sufficient data on the spinal fluid in acute infectious diseases have not yet been collected for the findings to warrant an absolute opinion. Skin lesions have been described, but are not constant in character and are present in only a small number of cases. Acute rickets is easily mistaken because of the fever, the prostration and the tenderness. The spinal fluid, however, is negative, and in poliomyelitis pronounced enlargement of the liver is not found. Tuberculosis of the hip can be differentiated by the history of onset. Acute rheumatic arthritis may commence acutely and the fever, pain and disinclination to move be very similar, but the tenderness is localized to the articular structures, and in poliomyelitis there is no swelling of the periarticular structures and no synovial effusion. Meningitis due to the meningococcus, to the pneumococcus, to the influenza bacillus,



to streptococci and staphylococci give a spinal fluid with cell increase due to polymorphonuclears, and the causal organism can be found in smears and can be cultivated. In tuberculous meningitis and syphilitic meningomyelitis the spinal fluid is very similar to that of poliomyelitis, and the clinical findings do not differentiate until the case has been watched for a few days. In tuberculous meningitis the bacillus can be found by repeated careful examinations, and in syphilitic meningitis the spinal fluid gives a positive Wassermann reaction. A positive Wassermann reaction in the blood is not sufficient to differentiate, as it may be found in acute poliomyelitis as in other acute infections. Even when evidence of paralysis or of involvement of the motor system is found, the diagnosis may not be clear. Tuberculous meningitis and syphilitic meningomyelitis require as careful differentiation in the preparalytic period. Evidence of tuberculous in other parts of the body and the absence of complete paralysis of muscle groups in a seriously ill child help to differentiate in the one case, and the signs of congenital syphilis in the development of the skeleton and the enlargement of the liver and spleen help in the other. Acute poliomyelitis is probably more often mistaken for cerebrospinal meningitis than for any other disease, especially as paralysis may occur in both, but the rash, the photophobia and characters of the spinal fluid should easily differentiate them. Brain tumors, tumors of the spinal cord, and many other conditions of the cerebrospinal axis have rarely to be differentiated. If physicians are alert and neglect no methods of examination that may help to a diagnosis, the abortive cases will be missed less often, and the frank cases will be recognized earlier and valuable help rendered in any attempts at prophylaxis by quarantine methods.

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## ANATOMIC FORM AND POSTURE, IMPORTANT FACTORS IN THE TREATMENT OF PULMONARY TUBERCULOSIS.\*

By JOEL E. GOLDTHWAIT, M.D., BOSTON.

IN that which is presented to you tonight it is my hope that lines of investigation may be suggested that will be of help in understanding the conditions which lead to tuberculosis, with the natural effect which such understanding should have upon the control of the disease. That my remarks are made with much hesitation is not strange, in the light of the admirable work of the men of this community, added to the fact that the treatment of this disease, apart from its manifestations in the bones and joints, has received but little attention from me. My reason for venturing to speak to you is that in my twenty-five years of work with the chronic patient, a little of the wonderful spirit of optimism which your great leader, Dr. Trudeau, so largely possessed, has come through to me, resulting in the belief that all of these chronic diseases must be understandable by, and ultimately controllable through, the human intelligence. In the study which this spirit has forced, certain things have been revealed which have not only benefited the patients who turn to me for advice, but which seem of equal applicability in many other forms of disease. With the hope that some of these principles may be of benefit in your work, in pulmonary disease, I am venturing to address you.

In the first place, in attempting to fathom the nature of the chronic diseases it has been clearly shown that, despite the text-book teaching, human beings are not all made alike. That there are distinct types, showing differences in contour of body, form of skeleton, texture of muscle, shape and attachment of viscera, etc., etc., there can be little question, and all of this has been fully described in the Shattuck Lecture.<sup>†</sup> Not only do these types of anatomic form exist, but apparently each type has its own more or less definite potential of disease, and of these types the one which most concerns us, because tuberculosis is a part of its pathologic potential, is the slender type, which has been designated by different writers as the congenital visceropetetic, the carnivorous, the hyper-onto-morph.

Why this type is so commonly tuberculous is not, of course, wholly plain, but there are certain suggestive features. In the first place, the individual is usually poorly nourished, due perhaps in part to the fact that the length of the small intestine, from which the food must be assimilated, is much less than the normal, frequently not more than half. The blood pressure is usually considerably below what is con-

\* Address delivered before the Saranac Lake Medical Society, at Saranac Lake, New York, Feb. 9, 1916.

† An Anatomic and Mechanistic Conception of Disease, BOSTON MED. AND SURG. JOUR., June 17, 1915.



sidered normal, suggesting, as does the poor nutrition, a low resistance. There is usually more or less anemia. The internal glandular secretions are frequently disturbed, as well as other evidence of abnormal physiology.

To recognize these disturbances of physiology, however, does not necessarily explain their cause, and in the attempt really to get back to the primal reasons the following facts were revealed.

The slender anatomic type, if it develops naturally, acquires habits of carriage in the periods of rapid growth, in which the ribs are lowered and the chest is used in the position of full expiration. In this position the thoracic breathing must be very imperfect, and full expansion of the chest rarely occurs. Under such restriction the lungs cannot develop their full strength. In normal breathing there should be a moderate excursion of the chest, with the rise and fall just about midway between full inspiration and full expiration. The average ratio is one and one-half to two inches above the neutral to full inspiration, with about the same below the neutral to full expiration. In the posture naturally assumed by the slender anatomic type (when standing), the neutral position is, however, from one-quarter to one-half inch above full expiration, with an excursion of from two and one-half to three and one-half inches

above this point in full inspiration. Naturally this position of full inspiration is rarely taken.

In this position, with the lowering of the ribs or the flattening of the chest, there are two distinct types. In one the lateral diameter of the thorax remains the same and the front wall of the chest simply drops downward (Fig. 1), exactly as if a hoop attached at the back were lowered in front. Since the anterior part of the rib normally is lower than the attachment at the spine, the lowering of the anterior part below this normal must naturally lessen the depth of the chest,—its anteroposterior diameter.

In the other type the ribs are narrowed in at the side, with the result that the lateral diameter is less (Fig. 2), but with the crowding in

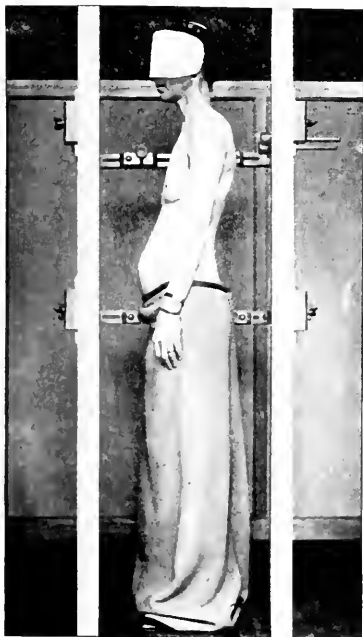


FIG. 1.—A case of pulmonary tuberculosis, in the slender anatomic type, with the chest flattened so that the antero-posterior diameter is less than normal. The lateral diameter is not changed.



FIG. 2.—The slender anatomic type with the lateral diameter much below normal, but with the antero-posterior diameter increased.

of the ribs from the side, the sternum must be forced forward, so that the anteroposterior diameter is usually above normal (Fig. 3). In this type of posture the lower ribs are drawn in so much that the angle formed by the edge of the lower ribs and the tip of the sternum is small and much less than the right angle, which is normal and which may exist in the other type of chest.

In the first type (Fig. 1), the chest is so much flattened that there must be less than the normal space for the heart, while in the latter (Fig. 3) this space is not as much interfered with. It is not impossible that this is one of the explanations for the rapid rate of the heart in some of the flat-chested individuals.

With the lowering of the chest to the position of full expiration, irrespective of whether the



sternum is flattened or forced forward, not only is the thoracic part of the respiration interfered with, but the position of the diaphragm must be



FIG. 3.—A tuberculous patient, showing the slender anatomic type, with the anteroposterior diameter greater than normal, due to the pushing of the sternum forward by the narrowing in of the ribs from the side.

changed, with resulting interference with its function. In normal breathing the movement of the diaphragm should be midway between full inspiration and full expiration (Fig. 4). With the posture here described, however (with the patient standing), the diaphragm is used

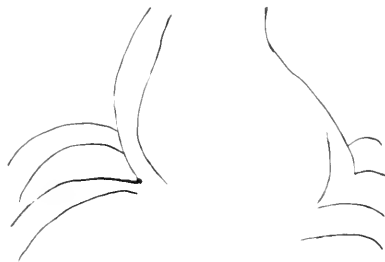


FIG. 4.—The photoscopic tracings of the diaphragm with the outlines of the heart taken of a person of the normal type of anatomy when standing. The two middle lines represent the excursion of the diaphragm in normal breathing. The uppermost line represents the position of the diaphragm assumed in full expiration, and the lowest line the position assumed in full inspiration. Note in this that the normal breathing should be just about midway between the two extremes. This condition is never seen in the slender or tuberculous type when the patient is standing.

at its low point or at full inspiration (Fig. 5), the upper point, or full expiration, being reached only when effort is made. This means



FIG. 5.—The photoscopic tracings of a patient of the slender anatomic type taken with the patient standing. The two middle lines represent the excursion of the diaphragm in normal respiration. The lowest line is the position of extreme inspiration, and the upper line the position of extreme expiration. It will be seen from this that in the slender type the excursion of the diaphragm is slight and only under considerable effort is anything like the normal excursion of the diaphragm made. When lying down flat upon the back and without pillows under the head, the diaphragm in this case at once assumed the position and the range of motion as shown in Fig. 4.

that this part of the respiratory mechanism must be seriously interfered with. From this not only must the lungs suffer, but from the appearance of the tracings it is probable that the heart action is also interfered with. Still further, this absence of the movement of the diaphragm must seriously interfere with the circulation in the abdominal organs, as well as interfering with their position and general function.

In the posture here described not only is the thorax changed in size, but with the lowering of the ribs there must be a narrowing of the space in the upper abdomen under the diaphragm. The result of this is that the proper amount of space in which the organs should lie does not exist, and because of this the organs must be forced downward, with undoubtedly more or less interference with the function of the organ displaced or of some of the other organs against which the displaced organs may be forced. With this crowding of the organs downward, the pads of fat which normally exist in the back of the upper part of the abdomen, are absorbed, and this absence of fat must expose the sympathetic ganglia in the upper abdomen, as well as such organs as the adrenals, the pancreas, the great blood vessels, etc., to injury or irritation. Just what this does to the physiology is probably subject to considerable variation and must be a matter of speculation; but since the respiratory function, as well as the circulatory, nutritive, and all of the involuntary functions of the body, are controlled by the sympathetic system, one cannot help questioning whether some of the symptoms which are seen in these cases are not to be explained by this mechanical stimulation or inhibition of these



ganglia. It is not our purpose to go into all the possible suggestive evidence in this line, more than to call attention to it and to state that apparently vigorous health does not occur until, with the general remodelling of the body, these fat pads are replaced.

That which has been stated thus far assumes that the body is studied in the standing position. Under these conditions the lungs cannot work rightly because of the change in the shape as well as the movement of the thorax, and also because of the change in the position, as well as in the movement of the diaphragm. This naturally results in the lungs being weaker and less resistant than is normal. Added to this, the disturbance of nutrition, with the possible disturbance to the physiology resulting from the irritation of the abdominal ganglia, and the conditions seem to be reasonably favorable for the development of disease, whenever the pathologic organism is introduced.

While all this is true if the body is considered when erect, it should also be remembered that other postures may be even more harmful. The relaxed or slouched position so commonly seen in sitting, or the more or less common bedtime position, with the head and shoulders raised upon two or three pillows (Fig. 6) may restrict



FIG. 6.—Not an uncommon position for patients to assume while in bed. The effect which such position must have upon the breathing or upon the function of the abdominal organs must be obvious.

the thoracic or diaphragmatic function even more than has been described. The position of the diaphragm under these conditions is crowded upward to the position of full expiration (Fig. 7), with very slight range of motion in breathing, while at the same time the position of the thorax is changed but little. This naturally increases the restriction of the breathing, and since, as is shown by the tracings, the heart at the same time is crowded upward into a more confined space, it is not impossible that some of the symptoms of disturbed circulation and thoracic distress may be due to this.

To understand the types of posture here shown, and to appreciate that which is naturally involved in the treatment, it should be remem-

bered that the suspensory ligament of the diaphragm is the pericardium, with the expansion at the top into the fascia that is attached to the sides of the low cervical spine (Figs. 8 and 9).

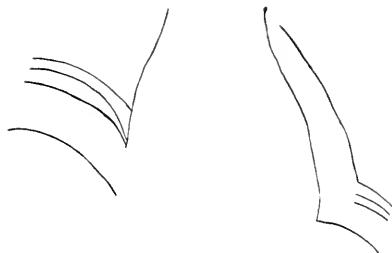


FIG. 7.—Fluoroscopic tracings of the diaphragm and the outlines of the heart taken with the patient lying down and with two pillows under the head. The two middle lines represent the excursion of the diaphragm in natural breathing. The upper line is the position of extreme expiration, and the lower line the position of full inspiration. From this it is seen that not only is the diaphragm raised and moves but little in ordinary respiration, but that it is forced up to the position of almost full expiration.

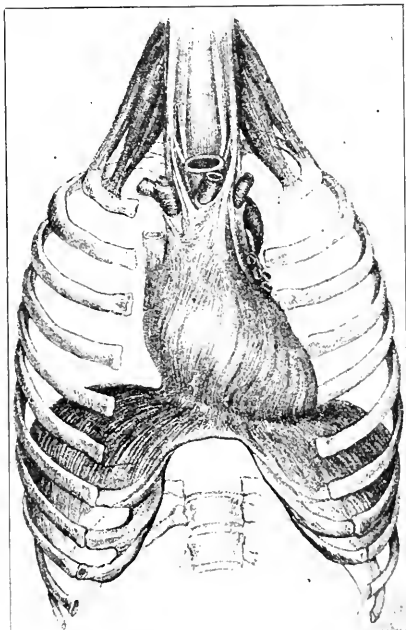


FIG. 8.—Showing the relation of pericardium to diaphragm with the extension of the fibres of the pericardium into the fibrous bands which are attached along the sides of the low cervical spine forming the suspensory ligament of the diaphragm.—*Archiv. f. Anat. u. Physiol.*, 1877, Taf. xv.

Drag upon this will result in the cervical spine being bent forward and the ribs lowered, as is shown in Figs. 1 and 3.

To raise the diaphragm and to elevate the



ribs, the cervical spine must be flattened as it is when the head is fully erect, and if this connection between the low cervical spine and the diaphragm is not appreciated, it can easily be demonstrated by standing with the body relaxed and drawing back the head, as if making a "double chin." One cannot do this without raising the ribs and drawing in the upper abdomen.

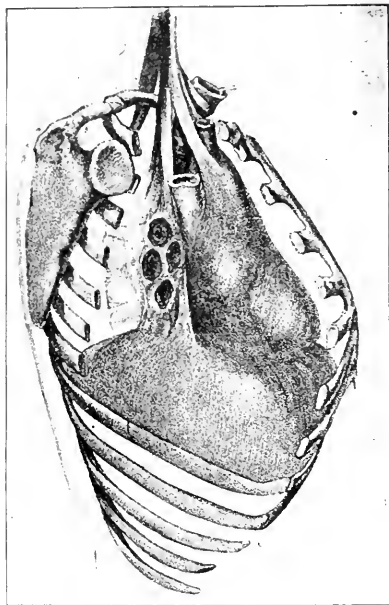


FIG. 9. Lateral view showing effect of the pericardium upon the diaphragm as the suspensory ligament with the fibrous bands extending up to the sides of the low cervical spine.—*Archiv f. Anat. u. Physiol.*, 1877, Taf. XI.

Of interest in this connection are the reflex acts of sighing and yawning. Both are, when analyzed, movements of the diaphragm toward full inspiration, and are made usually when one is sitting slouched or when pillowed up on couch or bed. The sigh or yawn is apparently to overcome the harmful effect of these postures. To sigh with the head forward and the chest relaxed is possible but not natural, while to yawn with the head and chest in this position is impossible. To yawn, the head must be raised, the upper spine straightened, and as a part of this the ribs and diaphragm are raised. Whether these instinctive acts are performed to relieve thoracic or abdominal discomfort, is not always plain, but that it must be partly thoracic there can be little question.

The practical suggestions which these facts have for us are, it seems to me, that if we are to do the best we can to ensure health, with the greatest amount of vigor to combat disease of

any kind, we must see that the body is so used that the rhythm of respiration, both as it refers to the thoracic and the diaphragmatic movement, is as nearly normal as possible. This is obtainable only when the body is used without being bent at the waistline or drooped. In sitting or standing the torso should be straight, as it would be if fully erect, and in lying down the same straight position without pillows should be insisted upon.

These positions not only ensure a better chance for the proper development of the lungs, but the abdominal organs must be drawn into better position, so that their function must improve also.

To use a back brace for a case of pulmonary tuberculosis may be unusual treatment, but with these facts before us it is not irrational, and both of the cases depicted in Figs. 1 and 3 were referred to me by men trained, as you are, in pulmonary disease, with the request that I do what I could by remodelling the body so that the lungs could have a proper chance to regain their strength, and thus arrest the disease. Since in both of these cases the disease was active at the time the orthopedic treatment was started, special gymnastic work could not be undertaken in the beginning, and braces which held the body erect and the chest raised, had to be used until the lungs had so far recovered that active exercise was possible, these braces being discarded as soon as the muscles had gained sufficient strength. Our aim should be to make the full excursion of the chest in inspiration and expiration possible with the least effort. Much emphasis is put upon giving such patients plenty of fresh air, but it must be obvious that the air cannot get into the lungs in any considerable amount if the chest is allowed to remain, as is shown in Figs. 1, 3 and 6.

The importance of the posture should be borne in mind at all times, and particularly as the patients are put out in the open to "get the



FIG. 10.—A more or less typical attitude, to be seen on the piazzas of our tuberculosis sanatoria, in which the breathing must be seriously interfered with, and which can easily be prevented by care in arranging pillows, stiffening the back of the seat, etc.





FIG. 11.—The same as Fig. 10, except that a board is placed on top of the canvas under the back of the patient. While this position is not ideal, the torso is relatively straight and the breathing comparatively little interfered with.

air." If propped up in bed, as in Fig. 6, obviously but little air can get inside the individual, and this is also true if some of the reclining chairs which are used at our sanatoria, especially the canvas steamer chair (Fig. 10) are allowed. The positions assumed in many of these must result in an increase in the mechanical difficulty under which the patient labors, with harm to the lung tissue rather than benefit. If such chairs must be used, the harmful features should be appreciated and corrected. With the canvas steamer chair the simple use of a board at the back placed on the canvas makes the chair much less objectionable (Fig. 11). If the bed



FIG. 12.—Half reclining position with pillows so placed that the torso of the body is relatively straight. To make this possible a large pillow under the knees to flex the thighs is necessary. The breathing in this position would be but little, if any, interfered with.

position is to be used, naturally the position of Fig. 12 is better from the point of view of thoracic function than Fig. 6.

If these things are recognized and the harmful features are prevented by training in childhood, at which time the types can be easily recognized (Fig. 13), it seems not improbable that



FIG. 13.—The slender congenital visceroptotic type as seen in childhood, showing at this early stage the same characteristic attitude with the flattened chest as is seen in the adult. This is the tuberculum type.

there will be less tuberculosis, because the vitality of the individuals of this type will be greater, and that when it does occur, its control will be more easy.



## THE TEACHING OF THERAPEUTICS AS A BRANCH OF APPLIED PHYSIOLOGY.\*

BY F. H. McCrudden, M.D., S.B., BOSTON.

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THE teaching of therapeutics is one of the weakest points in the training of the medical student. The actual details of treatment are taught incidentally to the other instruction in clinical medicine; and as the basis for such instruction the student is given a course in pharmacology dealing with the properties and action of drugs. But no systematic instruction is usually given in the *general principles* of therapeutics. The clinician says the course in pharmacology is not practical enough; the pharmacologist says the clinical instruction in therapeutics is not scientific. Both criticisms are wrong; so far as it goes, the instruction in

\* Part of an address read at the joint session of the Association of American Medical Colleges and the Federation of State Medical Boards, Chicago, Ill., Feb. 8, 1916.



therapeutics in both of these courses is usually good; but it is incomplete.

In the course in clinical medicine the attention of the student is directed chiefly to symptomatology and diagnosis; treatment is relegated to a subordinate position with the emphasis on the details. This emphasis on the details is correct enough in such a course. A disease may take such variable forms in different persons, and change so much from day to day in any one person that the treatment of every new patient is a new problem. In chronic diseases especially, where the exact details of treatment depend largely on the severity of the disease, on the extent to which function is disturbed, on the condition of the patient as a whole—factors concerning which exact measurements play as yet but a small part, and for which judgment is gained only by long clinical experience with cases of all grades of severity—we treat individuals rather than diseases. The details of treatment can, therefore, be learned only by the inductive method—long-continued bedside observation of many patients under treatment—now used in teaching the subject. But back of the many details there are certain general principles which can be discussed deductively.

Pharmacology deals with only a part of these principles, and then not from the standpoint of therapeutics. It deals with the physiological action of substances, independently of their therapeutic effect; with the action not only of therapeutically useful substances, but also others—muscarin, curarin, and saponin, for example—whose action is chiefly harmful; and in the case of useful drugs, not only with the therapeutically important activities, but also those of no therapeutic significance. Pharmacology has developed to such an extent that it is now pursued as an independent science without reference to the practical needs of medicine in the same way, and with the same justification that anatomy, physiology, and chemistry—once a part of practical medicine—are now pursued as independent sciences; and books are written on pharmacology, instruction is given in the subject, and research is carried on by men who are not physicians. In actual practice drug treatment is combined with other forms of treatment—light, heat, cold, exercise, posture, diet, massage, electricity, x-rays, and high altitude—an intelligent application of which depends on a knowledge of physiology, physics, chemistry, psychology, and other factors—the personality of the physician even—as well as pharmacology. A knowledge of pathology and clinical medicine especially, though not necessary for the pharmacologist, is an absolutely necessary prerequisite for the study of therapeutics; the therapeutically important questions relating to the effect of pathological conditions in altering the effect of drug action and to diagnosis and prognosis, which have to

be taken into consideration in deciding when and how to use drugs in disease, are outside the province of pharmacology.

A division of medical science dealing with the aims and methods of therapeutics and filling in the gap between physiology, chemistry, physics, pharmacology, and the other fundamental sciences which underlie the methods of treatment, on the one hand, and the actual details of treating individual patients from day to day, on the other, should be recognized; and a course in this subject should be added to the medical curriculum. The instruction should aim to give the student a point of view regarding these purposes and principles of treatment, so that these details may be contemplated, not as a vast number of empirical, and unrelated elements, but as mutually dependent parts of a whole; it should continue the emphasis on scientific habits of thought, which is one of the objects of instruction in physiology and the other fundamental branches of medical science, and bring out the fact that *therapeutics is not an empirical art, but an applied science.*

It is very important, too, to impress students early in their medical career with an optimistic and hopeful attitude toward the results of treatment. Since it is only through feeling confident of obtaining good results that the physician can carry out his treatment with enthusiasm, great attention should be paid to demonstrating that, under proper treatment, chronic disease has a hopeful outlook. Our optimism at the hospital, where my own course is given, is due not alone to the adoption of the physiological point of view regarding the purpose and principles of treatment, but also, in part, to the fact that we see the results of treatment *with the treatment properly carried out.* The less optimistic attitude of many physicians is due, not to the poor results of treatment, but to discouragement *at the difficulties of having treatment intelligently carried out in private practice*—a distinction that should be brought home to the student.

For an understanding of rational therapeutics a study of the treatment of chronic disease forms the best basis. As contrasted with the general supportive treatment of acute infectious disease, the treatment of chronic disease usually centers around improvement in the efficiency of some one organ or function; discussion and demonstration of treatment is, therefore, simpler. Changes due to the disease itself are less rapid than in acute disease, so that the effect of the treatment is more clearly discernible. The long duration of the disease makes possible a comparison of different forms of treatment in the same patient.

The treatment of chronic disease is very important. Only a small portion of the population suffers from acute disease at any one time; and the illness lasts but a short time—within a few weeks the patient is either well or dead.



But a large proportion of persons who have reached middle life suffer from some weakness of function, some handicap based on a physical defect—in its broadest sense some form of chronic disease; to adjust such persons to their handicapped condition, and thereby to maintain efficiency and comfort and to prolong life may require more or less constant medical attention.

The treatment of chronic disease is difficult. Compared with some of the clear indications for treatment in acute infectious disease—indications for diphtheria antitoxin, or for appendectomy, for example—the indications for treatment in chronic disease are lacking in precision. The severity of the disease, the degree to which functional efficiency is impaired—factors which determine the details of treatment—cannot usually be accurately measured; their estimation is subject to great errors of judgment; and estimations of the effect of treatment on such factors—on the degree of dyspnea, cyanosis, weakness on exertion in heart disease, for example—require not only skill and experience, but a certain amount of natural ability and aptitude. In the treatment of chronic disease, moreover, a broader view of all the circumstances of the case must be taken than in acute disease: facts concerning the patient's occupation and the state of the family and financial affairs may influence the treatment; for the few days during which they are sick, no matter what may be their family or financial responsibilities, all patients with such diseases as pneumonia or scarlet fever usually succeed in obtaining the same excellent treatment.

It may be objected that in presenting principles of treatment to students before they know much about the details of treatment, I am committing the very grave error of placing abstract ideas before concrete examples. The objection may be raised, too, that the subject of the purposes and principles of therapeutics is one of great controversy, that different physicians have different points of view.

As to the first objection: It is, of course, true that empirical experience should precede scientific conception; that educational advance should proceed from the concrete to the abstract. But this cannot be used as an objection to a course such as I have outlined; for I have discussed here only the *subject matter* of the course, not the *method of presentation*; in presenting the subject matter the instruction can be, and should be based upon and proceed from concrete examples of treatment.\*

As to the controversies: The principles as laid down should not be taught as rigidly crystallized doctrine; the purpose should be not to inculcate dogma, but to enlighten the understanding and to stimulate the use of the intelligence in the application of treatment. Scientific education should consist not so much in the accumulation of facts, as in the development

of scientific habits of thought; in the cultivation of correct points of view; in the establishment of a state of mind in which the facts can take their proper place. Some of the details of treatment, as laid down, may be of doubtful value, details that research is constantly modifying; so, too, elements of even greater moment, some tenets of the principles of treatment as stated, may exhibit faults and inconsistencies, or a distorted perspective in the emphasis laid on different parts. This is unavoidable. The details and facts must be used as the stuff out of which the ideas are formed; but they should not be taken for the idea itself. The physiological point of view regarding the purpose and principles of treatment\* may be compared with a wave; though the actual physical particles of which the wave is composed change from instant to instant, the wave maintains its form and character. It may be compared with life itself—with a unicellular ameba, for example; the ameba is continuously changing its form, and the particles of which it is composed are constantly changing; but the living essence, the cell itself, remains. Under the influence of a correct point of view, facts arrange themselves in order, like iron filings under the influence of a magnet. The physiological point of view serves to bring system out of chaos; a statement of the facts of therapeutics, subordinated to certain guiding ideas, is to the disordered array of unrelated "remedies" and prescriptions, which the student commonly accumulates, what a disciplined army is to a mob of individuals. The point of view is simple, definite, and clear; and it is elastic enough to respond to the necessity of incorporating newly discovered elements of treatment. The chief guides in determining what principles to lay down should be *usefulness and elasticity*; the test of usefulness to restrain any tendency toward barren abstraction; that of elasticity to avoid the other extreme of fixed and rigid canon. As details become obsolete they can be replaced by better ones; but even though large parts of the scheme of treatment have to be altered to conform to the results of scientific progress, the idea itself—like the ameba or wave mentioned in comparison—will still remain as a paradigm.

Since students take up the study of medicine for the purpose of learning to treat sick patients, such a course as that which I have outlined should be the most important in the curriculum. The practical purpose of courses in pathology, physiology, diagnosis, and the other fundamental branches is to help in understanding the treatment of patients; and the details of therapeutics as demonstrated in the subsequent clinical courses are merely illustrations of the practical application of the principles of therapeutics.

\* For the details of such a course see my paper in the BOSTON MEDICAL AND SURGICAL JOURNAL, Vol. cxxiii, p. 574, 1915.

\* See F. H. McCradden: The Treatment of Chronic Disease Is a Problem of Applied Physiology, BOSTON MEDICAL AND SURGICAL JOURNAL, Vol. cxlxx, July 15, 1916.



## Clinical Department.

### EXFOLIATIVE DERMATITIS FOLLOWING NEOSALVARSAN INJECTIONS.\*

BY RENÉ BINE, M.D., SAN FRANCISCO, CAL.

SOON after the introduction of salvarsan and neosalvarsan in our therapeutic armamentarium, skin manifestations following their administration attracted considerable attention. Various degrees of erythema and dermatitis occurred with great frequency, but usually of such a degree, and of such short duration, as to arouse scientific interest rather than uneasiness. Many of these eruptions were found to be due to so-called "Wasserfehlern,"<sup>1</sup> while others were attributed to patients' idiosyncrasies.

Genierich<sup>2</sup> states that other symptoms indicating hypersensitiveness to salvarsan, usually precede the severe skin lesions. He reports one case where these warnings being disregarded, severe toxic reactions, including a generalized dermatitis, resulted.

Swift's case,<sup>3</sup> a patient with leukoplakia, developed a severe vesicular dermatitis after his eighth treatment. He then was without treatment for eight months, at the end of which time a single intravenous injection of 0.3 gm. was accompanied by a sensation of pressure in the chest, followed in four hours by a generalized erythematous eruption which later became vesicular. Swift considered such reactions as due to anaphylaxis. They appeared only after repeated injections.

Genierich<sup>2</sup> states that icterus is most apt to occur if one exceeds eight injections, or an amount of 4 gms. during an intensive cure. In addition to other toxic effects, the liver may be swollen and tender, the stools acholuric; the patient usually suffers from dyspepsia. Recovery occurs within three or four weeks.

Stulmer<sup>4</sup> states that exanthemata following salvarsan usually appear after seven to twelve days, and that skin reactions were most often seen in those cases where the second or third dose came on the seventh or eighth day. He found that as soon as the eruption had disappeared, he could safely continue the treatment.

Kersten<sup>5</sup> reports a case of a Japanese prostitute, age 20, who because of a chancre, received 0.6 gm. 914 intramuscularly on Aug. 6, 1914. A second similar dose on Aug. 10, 1914. That night 39 C; felt ill, nausea. Inside of two days eruption involving mucous membranes, with edema of face. Skin soon became bluish in color, and later covered with vesicles. Mentality clouded. Inside of a week, practically well.

Wechselmann<sup>6</sup> believes that many of the eruptions attributed to salvarsan poisoning may be really due to the mercurial medication employed in most reported cases. On the other hand,

A. Neisser has shown quite conclusively that severe, universal, exfoliative and ezeematous erythemas may follow the use of salvarsan in cases where no mercury was ever prescribed.

Spence's<sup>7</sup> case presents such points of interest as to warrant an extensive report.

Male patient, age 25, contracted syphilis early in August, 1914, but had no treatment until October 31st, when he appeared with well developed secondaries, including a profuse maculopapular rash and mucous membrane lesions. Six weekly intramuscular 40% grey oil injections. Three weeks later, i.e., Jan. 3rd, 1915, 0.6 gm. Billon intravenously. Severe headache next day. January 9, diffuse erythema. January 23rd, dermatitis with edema of face and extremities, pyrexia; consequently admitted to hospital where he remained nearly six months with a most pronounced and versatile general dermatitis, intense erysipeloid erythema being first associated with vesicles, blebs, pustules and impetiginous areas about the hands, nostrils and lips, and then a copious and prolonged desquamation. Concurrently developed severe nasopharyngeal inflammation, mucopurulent conjunctivitis, weakness, emaciation. Every vestige of hair, finger and toe-nails shed. No gastro-intestinal, renal or nerve involvement. Was home in bed for two months more. Ten months after injection, head still showed a few small patches of cicatricial alopecia and a great thinning of hair. Nails had all returned. Marked pigmentation and slight brawny desquamation still seen; moderate keratosis palms and soles.

In the discussion, following Spence's report, Mr. McDonagh said that he considered this case a typical instance of the form of arsenical poisoning seen on using French and English substitution products for "606" and "914." He had seen nine similar cases, two of which had ended fatally. In no case had more than two injections been given, and in some only one. In one case the dermatitis did not appear for nine weeks after the injection. Before the war he had seen only one case of exfoliative dermatitis following the use of salvarsan.

The following case, presenting many unusual features and questions of practical interest, is reported in detail.

Miss N., stenographer, age 19. First seen June 1st, 1915.

*Family History.* Mother died one year ago of some acute psychosis. Father living, quite nervous. One sister and one brother alive and well, also several maternal uncles and aunts. No syphilis in family so far as can be elicited.

*Past History.* Measles and chicken-pox in childhood. Pneumonia as a baby. No scarlet; no typhoid; no malaria.

*Present History.* February, 1915, an eruption appeared all over the body, including face. Felt perfectly well; had no fever, and if it were not that the eruption appeared on the face, would not have consulted a physician. The

\* Read before the San Francisco County Medical Society, April 4, 1916.



eruption was very intense; there was marked swelling of the lower extremities which were intensely red, and pitted on pressure. Had no sore throat. Dr. Y., the family physician, thought that she had scarlet fever, and kept her in bed one week, but the course of the disease obliged him to abandon this diagnosis. When the eruption had entirely disappeared, a Wassermann test was done; the report was ++.

Dr. Y., therefore, informed the patient that the rash was probably syphilitic, but that he was puzzled because of the absence of any primary sore, or possible source of infection. He prescribed mercury pills, of which she took twelve daily from that time up to the present date. In the meantime the patient's family physician died; on that account she consulted the writer. (Not wishing to worry her relatives, Dr. Y. and Miss X. kept them in ignorance of her disease.)

Physical examination revealed no abnormality; no skin lesions; no mucous patches; no anemia; no fever; no signs of involvement of organs of special sense; no bone or nerve lesions; no adenopathy; hymen intact; urine O.K.

**Diagnosis.** In the absence of any signs of syphilis and realizing that errors in Wassermann interpretations occur, as well as in view of the fact that scarlet fever at times gives a positive Wassermann reaction, we felt that it was absolutely necessary to repeat the test before proceeding with any treatment.<sup>8, 9</sup> The patient was informed that if the Wassermann test was reported negative, it would be necessary to repeat it at a later date, as she had, as before mentioned, taken considerable mercury.

June 8th, 1915. Wassermann was reported + + +. We were obliged to assume the correctness of Dr. Y.'s diagnosis, and to treat the patient accordingly. Because of her occupation, and of her desire to keep her illness secret, it was decided to give her mercury injections, and, as soon as her work would permit, to give her some injections of neosalvarsan.

June 15th, 1915. One c.c. of 10% mercury salicylate intramuscularly; this was followed by considerable abdominal pain.

June 28th, 1915. Mercacodol 2 c.c. intramuscularly.

July 6th, 1915. Neosalvarsan 0.9 intravenously; no after effects.

July 8th, 1915. Mercacodol 2½ c.c. intramuscularly.

July 12th, 1915. Neosalvarsan 0.9 intravenously.

July 13th, 1915. Patient phones that she had severe headache, otherwise happy and at work.

July 16th, 1915. Patient feels miserable, at times chilly, at times warm; feels bilious and thinks a physic would do her good. This morning noticed a slight eruption on her forearm. She had gone walking in the hills July 12, and had been exposed to poison ivy to which she was

subject; she thinks that this accounts for the eruption.

**Examination.** Hands are markedly tremulous. There is an eruption composed of small, reddish macules, on the flexor surface of both forearms. No eruption on rest of body. Temperature 101.8. Throat, negative.

**Treatment.** Aspirin 0.3, to be taken every four hours. A dose of salts to be taken immediately.

July 19th, 1915. Patient states that her eyes have been very much injected and reddened during the last few days, and that a marked eruption had appeared on her arms and legs. Eyes today are considerably better and the eruption has gone.

**Examination.** Except for very faint macular eruption on the arms, nothing found.

July 26th, 1915. Feeling perfectly well. Wants treatment continued.

**Treatment.** Mercury salicylate 10%, 1 c.c. intramuscularly.

August 8th, 1915. Patient complains of an itching eruption all over the body. She says that it is exactly the same sort of a rash as the one she had when she first consulted Dr. Y. Feels tired and depressed.

**Examination.** There is a scarlatiniform eruption over entire body, most marked, however, over arms and legs. Here, in spots, skin is infiltrated and raised. Conjunctivae edematous; face quite swollen and covered with eruption. Legs swollen; patient can hardly get into shoes. No swelling of mucous membrane of mouth. Urine negative.

**Treatment.** R. Salol 4.0; divide in pulv. No. 12. Sig: 1 every four hours. To remain in bed on milk diet.

August 12th, 1915. Patient does not feel at all ill, but the skin of face, as well as rest of body, so swollen as to disfigure her beyond recognition and deprive her of desire of even leaving room.

**Examination.** Diffuse erythematous eruption over the entire body; marked edema involving particularly the face, so that the eyes are almost closed. Legs markedly swollen and reddened, eruption here being definitely purpuric. Legs pit on pressure. Abdomen slightly distended; liver easily felt about 4 or 5 cms. below right costal margin; edge not tender. Spleen; moderately soft; easily palpable on deep inspiration. Temperature and pulse normal. Conjunctivae icteric. Skin has yellowish hue which can be recognized in spite of intense rash. Urine; traces of albumin; trace of bile; few hyaline casts. Stools; clay colored.

**Examination.** August 14th, 1915. Purpuric eruption covers legs. On close examination one can see minute hemorrhages in skin wherever involved. Eruption most marked over upper and lower extremities; trunk of scarlet red color, through which one can see yellowish tinge of jaundice. On neck are small spots, about the size of a nickel, where desquamation has begun.



On back of heel is a very large desquamating area. Slight but offensive yellowish oozing all over trunk and face. Considerable vaginal discharge.

August 16th, 1915. Marked desquamation over entire body; over posterior surface of legs, skin coming off in great big pieces. Jaundice still quite distinct. Stools a bit darker and urine lighter in color.

August 18th, 1915. Urine still contains bile. Stool markedly clay colored.

August 24th, 1915. Patient still worried about her condition, but outside of that feels perfectly well.

*Examination.* Still disfigured beyond recognition. Face swollen; eyes still closed, jaundice still present.

September 4th, 1915. Face is drying; oozing of yellowish serum is less, but skin is getting cracked, particularly around lips and eyes. Skin is under marked tension, so that the eyes are kept wide open, and patient has difficulty in seeing.

*Treatment.* Boracic ointment to be applied over face, in form of a mask. Also compound cathartic pills to be taken, one at bedtime.

September 28th, 1915. Hair has been coming out quite considerably.

*Examination.* Quite bald over front part of head; hair is very thin even over back of head. Arms great deal better but face still covered with scales; the legs still of a deep purple.

October 1st, 1915. Hair has all come out. Complaints of vaginal discharge. Smears made from latter show numerous pus cells and a few gram negative cocci and diplococci; no intracellular organisms.

January 11th, 1916. Hair has begun to grow; is about one inch to one and a half inches in length; and quite thick, but light in color. Face still somewhat puffy. Legs distinctly purpuric. Hard edge of spleen easily palpable.

March 20th, 1916. Wassermann: faintly positive.

1. What was the nature of the eruption, which led the patient to consult her physician? From her description, it must have been of a scarlatiniform type. Unfortunately the dead physician's records are not available. He told her, however that the original infection must have occurred a few weeks before the rash,—this in spite of the absence of signs of primary lesions. Late secondary syphilides are not unknown, but the intense cutaneous reaction, the deep color, and rapid evolution of the eruption are certainly against its having been luetic. The Wassermann reactions deserve consideration, especially as the first two were triple positive, the last one only being but faintly positive. Is the presence of a positive Wassermann, proof of an active syphilis demanding treatment? Have we reached a stage where we are to treat a positive Wassermann, or should we still confine our efforts to treating a patient, leaving otherwise clinically healthy persons alone. We

know how unreliable Wassermann reports may be. We nevertheless believe that in most instances an absolutely positive Wassermann reaction indicates the presence of living spirochetes in the organism, and that we are justified in diagnosing syphilis whether symptoms are or are not present, and whether there is or is not a history of infection.<sup>10</sup>

2. What caused the purpura, jaundice, big liver and big spleen which manifested themselves twelve days after an injection of mercury, twenty-seven days after a second dose of neosalvarsan? The neosalvarsan was given in two relatively large doses, at a six-day interval. In addition to a relative overdose, and even assuming a possible idiosyncrasy to the drug, could such reactions be due directly to neosalvarsan poisoning? (Spence's case is perhaps the only one on record, which can be at all compared to ours.)

The larger part of the injected drug reaches the liver, which is, therefore, subjected to its action. Of this action we know nothing except by clinical results, and we cannot explain why some injections are followed by light subicteric coloring of the conjunctivae and skin, others by well marked jaundice with symptoms from other organs as well. These conditions have, however, been observed, where relative or absolute overdoses have been injected, or where the liver itself was previously diseased, thus rendering it easily affected by small doses.<sup>11</sup>

In our cases we must conclude, that while the patient's original eruption may have been syphilitic, the weight of evidence is apparently against such a diagnosis, and rather suggests a general exfoliative dermatitis.

We certainly cannot consider the eruption a late manifestation of congenital lues, there being no signs of such trouble. To explain the positive Wassermann on this basis, does not seem justifiable, the family history apparently excluding this. The patient's brother was the only member, however, whose blood could be tested, and here the Wassermann was absolutely negative.

We must further conclude that while the skin lesions following the administration of the neosalvarsan may have been due to arsenic poisoning, they bore sufficient resemblance to the first eruption as to warrant assuming a common etiology. As to the nature of the latter, we do not feel justified in drawing conclusions.

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## A REVIEW OF 127 CLINICAL CASES OF ATAXIC PARAPLEGIA.\*

By G. H. BIGELOW, BOSTON.

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FROM 1903 to November, 1915, the out-patient records at the Massachusetts General Hospital show that the diagnosis "ataxic paraplegia" has been made 127 times. Of these, 70% were males, whereas in the whole Out Patient Department, approximately 58% are males.

In 83 cases we established a possible etiology, though some, perhaps, on rather meagre evidence. They were: syphilis 43, following accident 10, following acute infections 6 (diarrhea, grippe, rheumatic fever, typhoid, infectious arthritis, and meningitis), hemiplegia 5 (which suggested hypertension with possible hemorrhage, etc.), alcoholism 5, malformations or irregularities of the spine 3, hypertension (at time of examination) 3, chronic disease 2 (gout and sepsis), exhaustion 2, anemia, lead poisoning, neurotic family history, exposure, heredity, tumor and pellagra, each one. In 44 cases no possible etiology could be found.

Of the 43 syphilitic cases only 7 showed positive laboratory findings in the blood (3 cases), or spinal fluid (2 cases), or both (2 cases). Two were strongly positive, one moderately, and one weakly positive, while three were reported "positive" without any qualification. One case was considered positive in spite of negative laboratory findings because of the marked improvement with salvarsan. Eight gave a history of syphilis; 6 showed it clinically, that is, there were scars and pupils; 18 were syphilitic clinically and also by history; while 2 showed it clinically and therapeutically, i.e. improved under anti-specific treatment. One was diagnosed in the House, spinal syphilis in spite of negative laboratory findings on the basis of symptoms and irregular pupils. Thus it would seem that syphilis as an etiological factor in ataxic paraplegia is, of course, far less constant than in tabes, and when present is less frank, giving moderately positive or negative laboratory findings.

This is quite contrary to the statements in the literature. Gowers<sup>1</sup> says, "A history of syphilis is as rare in paraplegia as it is common in locomotor ataxia." Dana<sup>2</sup> agrees with this. Osler<sup>3</sup> denies the relationship to syphilis except in rare instances. Putnam<sup>4</sup> finds the indications

of syphilis exceedingly rare, if not wholly absent.

Here is the history in brief of one of the typical cases:

William S., age 36, seen first in October, 1903, complaining of weakness of the legs, of insidious onset, which the patient dates from a fall on the ice six years before. Feet feel as if walking on felt. Difficulty in walking in the dark. Severe frontal headaches for the past two months. Physical examination shows impaired muscle sense, otherwise negative. A year later unequal and irregular pupils were noted. In 1910 examinations showed increased knee-jerks, positive Babinski and clonus, urinary incontinence and a spastic gait. Dr. Baldwin notes that it is a typical case of spastic paraplegia. In 1914 two blood Wassermans were done and both were positive. Last November besides the signs mentioned above, he showed a positive Romberg. His ataxia was so great that he was forced to use crutches. There was subjective numbness as high as the crests of the ilia. Pain and temperature sense were normal, but light touch was impaired. The urinary incontinence had improved. His arms were unaffected. Before the days of the Wassermann this case would without doubt have been considered of traumatic origin.

The complaints given at the first visit were tabulated. Of the 127 cases, 112 or 88.3% complained of objective or subjective disturbances of the legs. Of the other 11.7%, the primary complaint was in some cases urinary disturbances, in others paresthesia or weakness of the arms, dizziness, headache, etc. It is because of this preponderance of leg complaints, undoubtedly, that 50% of the cases not admitted directly to the Nerve Room, were sent to the Orthopedic.

The predominant symptoms were also tabulated. Those showing principally spasticity were 52, ataxia 49, paresthesia 9, bladder symptoms 3, flaccidity 3. In 11 cases the notes were so meagre that it was impossible to determine.

The treatment was enormously varied. It included mercury, salvarsan, K I, Zander, electricity, massage, Fowler's solution, iron, brace, jacket, Thomas heel, advice, urotropin, and "stop lead." In each case the etiological factor, when discovered, was attacked; otherwise the treatment was symptomatic.

As to the course of the disease, only 71 cases returned often enough for any conclusions to be drawn. Of these 25 were better, 18 were worse, and 27 practically stationary. One patient was entirely cured, according to the record, but the notes are so meagre that the diagnosis may well be questioned.

In conclusion it seems from the analysis of these cases that syphilis is an important etiological factor in ataxic paraplegia.

### REFERENCES.

- <sup>1</sup>Gowers: *Lancet*, 1886, Vol. i, p. 1.
- <sup>2</sup>Dana: *Jour. of Nervous and Mental Diseases*, 1899, Vol. XXV, p. 1.
- <sup>3</sup>Osler: *The Principles and Practice of Medicine*, 8th ed., 1914, p. 943.
- <sup>4</sup>Putnam and Taylor: *Jour. of Nervous and Mental Diseases*, 1901, Vol. XXVIII, p. 1.

\*Read at a meeting of the Boylston Medical Society, Feb. 4, 1916.



## Book Reviews.

*Artificial Feeding of Infants. A Technique for the Calculating of Percentages and Values in the Artificial Feeding of Infants.* By MERRICK LINCOLN, M.D., Assistant Visiting Physician to Memorial Hospital, Worcester, Mass., assisted by GEORGE CHANDLER LINCOLN, M.D., Assistant Visiting Obstetrician to Memorial Hospital, Worcester, Mass. Worcester, Mass.: The Davis Press. 1916.

This little pamphlet, which can easily be carried in the waistcoat pocket, contains an immense amount of information culled from textbooks and periodicals. We know of no place in which so much has been collected in so small a space. It is truly a *multum in parvo*. It contains tables showing the analyses of milk and cream, the percentage requirements of babies of various ages, the composition of various foods, both non-proprietary and proprietary, as well as many others. It gives methods for the modification of milk and for the calculation of the caloric value and composition of food mixtures, as well as many other valuable data. It is intended, as the author states, rather for the pediatricist than for the beginner or the busy practitioner who wishes a short cut. It should prove of value, however, to everyone who will take a little trouble to become acquainted with the rudiments of infant feeding before he attempts to use it. Our only criticism is that the methods of calculation advocated seem to us unnecessarily long and complicated.

*Diseases of the Skin.* By HENRY H. HAZEN, A.B., M.D. Two hundred and thirty-three illustrations, including four color plates. St. Louis: C. V. Mosby Company. 1915.

Text-books on Dermatology by American writers have been appearing with bewildering frequency of late. One reason for this increase may be found in the perfecting of modern photography and processes of reproduction, as it is easily possible nowadays to produce a book filled with graphic and accurate representations of cutaneous conditions such as were unknown to the earlier writers. Dr. Hazen says in his preface that his apology for adding another book to the existing collection is, that in his opinion, there is at present no book altogether suitable for either the student or general practitioner, as he regards the large works as too voluminous, while the small books he characterizes as "rather exaggerated quiz compendiums," not sufficiently comprehensive. His attempt has been to describe fully the common diseases, accompanied by illustrations of their histopathology in many

instances. A short introduction by Dr. Gilchrist emphasizes Dr. Hazen's claims to fitness for his task. The book is clearly written, and a judicious amount of space, in relation to the size of the volume, seems to have been given to each topic. The illustrations are very good and very instructive.

*Surgical Operations with Local Anesthesia.* Second Edition. By ARTHUR E. HERTZLER, A.M., M.D., Ph.D., F.A.C.S., Surgeon to the Halstead Hospital, Kan.; the Swedish Hospital, Kansas City, Mo.; and to the General Hospital, Kansas City, Mo. New York: Surgery Publishing Company. 1916.

Four years ago, Hertzler published his first edition. The present volume is one-third larger than the first, and more profusely illustrated, containing about three hundred pages and an equal number of good pictures. The simpler operations were considered in the first volume, but the present work includes most of the major operations. It is true that the technique of producing safe and satisfactory anesthesia is described with far greater detail than is bestowed upon the operative procedures as such, but this is perhaps fair, when the scope and title of the book are considered. The author repeatedly and rightly emphasizes the fundamental importance of a careful and thoroughly developed technique; with the drugs now at our disposal, it is the surgeon's fault if the anesthesia is not complete. But an adequate technique in this as well as in other procedures can be acquired only by study and patient practice. The book is again recommended to students and surgeons.

*Twelve Lectures on the Modern Treatment of Gonorrhea in the Male.* By P. ASCH, M.D., (STRASSBURG). Translated and Annotated by FAXTON E. GARDNER, M.D., Lecturer and Assistant Visiting Genito-Urinary Surgeon, New York Polyclinic; Assistant Genito-Urinary Surgeon, Bellevue Hospital, Out-Patient Department, New York City. New York: Rebman Company. 1915.

This book is not in the least like most small compendiums of knowledge, which it resembles in size and appearance. It consists of twelve short concise lectures on the "Treatment of Gonorrhea in the Male," and it embodies the author's personal briefs and experience, well translated into English. The paper and type are good and the few illustrative sketches are adequate for their purpose.



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## THE NEW YORK POLIOMYELITIS EPIDEMIC.

THE epidemic of poliomyelitis, whose progress we have noted in previous issues of the JOURNAL, has assumed serious proportions, and at the present writing shows little or no evidence of abatement. The report from New York, on July 13, states that there had been 1557 cases and 311 deaths since the outbreak of the epidemic. These figures show a continuance of the relatively high death rate (over 20%) which has characterized the disease in this outbreak.

Not the least serious aspect of this epidemic is the likelihood, indeed almost the inevitability, not only of its persistence, even in controlled form, throughout the summer in New York, but of its diffusion to other parts of the country. The disease originally appeared in poorer and more crowded quarters of the city, but has extended to other localities; and many of the more well-

to-do residents of the city have taken their children away as refugees. Such migration is almost certain to spread the infection, in addition to other possibilities of its dissemination.

Already many cases have appeared in other communities, though it is by no means certain that these are instances of direct transference of infection. There are at present fourteen cases in Massachusetts, of which three are known to have come from New York. The distribution of these cases is as follows: three in Fall River, two each in Pittsfield, Westfield, New Bedford and Worcester, and one each in Lowell, Lawrence and Haverhill. One death from the disease has occurred at North Adams. No cases of the disease have yet been reported in Boston. In New England, cases have been reported in Vermont, Rhode Island, and Connecticut, but none as yet in Maine or New Hampshire. Eleven cases have occurred in Rhode Island with one death, and two cases in Connecticut. There has been only one case in Vermont.

In other parts of the United States the disease has made sporadic appearance. There are 82 cases in New York State outside of New York City, two cases in Philadelphia, 27 cases in Illinois, with one death in Chicago, one case and one death in Baltimore, two cases in Indiana, three in Minneapolis, one in Nebraska, six cases and one death in Wisconsin, and six cases and one death in Newark, N. J. Five cases were also reported in Montreal on July 7.

In New York, and in all other affected communities, drastic measures for the control of the epidemic have been taken. Of these, almost the most important is the immediate reporting and isolation of suspected cases, and this is a duty which falls primarily upon general practitioners. As a guide to them in dealing with the disease, the Boston Health Department has issued to physicians in this city the following circular letter of instruction, which should be studied and observed by physicians throughout the State:

"The present outbreak of anterior poliomyelitis or infantile paralysis in New York City has brought this disease prominently before the public. Fortunately Boston has no cases of this disease at the present time, and thus far this year but one case has been reported.

"Infantile paralysis is an acute infectious disease, and is to be feared, not only on account of



the great danger to life, but because in many cases where a patient survives it leaves him disabled for life. Permanent paralysis or greatly impaired functions of the arms and legs are the most common results.

"This disease attacks people of all ages, but the greatest incidence is always among children, especially those in the first half decade of life. Children under five years of age furnish usually from 50 to 90% of the cases of poliomyelitis. In some epidemics the disease is almost as prevalent in children between the ages of five and fifteen years as in those under five, but adults, constituting usually about half of the population, seldom furnish more than 10% of the cases, and usually this percentage is smaller. In children under five, the greatest number of cases and deaths occur in those between one and two years of age.

"Strong and healthy children are attacked with as much frequency as weak children, and it does not confine itself to either the rich or the poor.

"Anterior poliomyelitis has been epidemic on both eastern and western hemispheres, in torrid as well as frigid zones, in thinly-settled, remote country districts as well as the thickly-congested sections of our large cities; and, contrary to usual epidemics, it does not necessarily follow the direct routes of travel. During the last epidemic in New York it spread to northern New England, but it did not attack the people in the large cities to the west and south of New York, reached by countless thousands daily, or by the most direct routes of travel. It has been found that the spread of this disease is rapid, but is irregular in its course, and in country districts, where the population is sparse and oftentimes separated by distances, it attacks a greater percentage of the population than in the congested sections of cities. Poliomyelitis usually makes its advent in May and continues until August.

"Boston has been unusually clear of this disease, and whereas in epidemics the mortality reaches about 25%, the percentage has been very low in this city.

"The virus has been found in the tissues and secretions of persons who have died from poliomyelitis and in the secretions of persons acutely ill with the disease, and there are three sources of infection: 1. From those ill with the disease. 2. From those convalescing. 3. From 'passive carriers.'

"The virus in the body exists in the discharges from the nose and throat, and also in the intestinal discharges of those who are ill, and is received into the body through the mucous membrane of the nose and throat. Therefore, kissing, coughing, and sneezing may carry the secretions of nose and throat from the sick to the well. Infected nasal discharges are probably the most common vehicle of spreading the

infection. Persons harboring the disease germs, but showing no symptoms of the disease, may be the cause of its spreading.

"With these facts before us it is the earnest hope of the officials of the Health Department that epidemic infantile paralysis will not strike here. However, preparations have been made, and the department is ready for any emergency. At the present time the Health Department especially desires your coöperation and assistance for the care and control of this disease. By reporting immediately all cases that come to your attention, with the history of the children coming recently to this city from an infected area, and reporting all suspicious cases that may be called to your attention, this threatened outbreak may be averted.

"The office (Fort Hill 5100) is open from 9 a.m. to 11 p.m., Sundays and holidays included, for the report of contacts and cases. Telephone charges may be reversed.

"F. X. MAHONEY, M.D.,

"Health Commissioner."

As a further aid to physicians in reviewing for prompt recognition the symptoms of the disease, the JOURNAL is publishing in another column of this issue a special article by Dr. Francis R. Fraser of New York on the symptomatology and diagnosis of the disease in its acute stages. This article is especially recommended to the medical profession for attentive perusal.

By way of treatment, Dr. Beverly Robinson of New York has suggested the exhibition of ammonium salicylate, which he believes to have a bactericidal value.

The especial attention of physicians is also called to the recently published (July, 1916) number of the *American Journal of Orthopedic Surgery*, which is issued as a symposium on infantile paralysis. In a series of expert papers, this symposium discusses the later surgical treatment of the complications and sequelae of the disease which, during the period succeeding so violent and extensive an epidemic as the present, are certain to be seen in considerably increased numbers.

It is earnestly to be hoped that by the intelligent and alert coöperation of every practitioner of medicine, the suppression of the lamentable epidemic now in progress may be speedily secured and its extension into new fields prevented.



## AMERICAN COMMITTEE FOR MEDICAL PREPAREDNESS.

IN another column of this issue of the JOURNAL we take pleasure in publishing a communication from Dr. Horace B. Arnold on "The Unpreparedness of the Medical Profession." The facts which he points out relative to the status of our profession as regards its readiness for war service are extremely pertinent and significant. That they have not escaped the realization of others, and that steps have already been taken to remove some of the defects of our professional organization for this purpose, is evidenced by the work already accomplished by the advisory committee of civilian American physicians and surgeons on medical preparedness.

This committee was jointly appointed in the spring of 1916 by the presidents of the American Medical Association, the American Surgical Association, the Congress of American Physicians and Surgeons, the Clinical Congress of Surgeons of North America and the American College of Surgeons. Its personnel was as follows:

William J. Mayo, Chairman, Rochester, Minn.; Frank F. Simpson, Secretary, Pittsburgh, Pa.; Frank Billings, Chicago; John F. Binnie, Kansas City, Mo.; Joseph C. Bloodgood, Baltimore; George E. Brewer, New York City; George W. Crile, Cleveland; J. M. T. Finney, Baltimore; Charles L. Gibson, New York City; Robert G. LeConte, Philadelphia; Fred B. Lund, Boston; Edward Martin, Philadelphia; Franklin H. Martin, Chicago; Rudolph Matas, New Orleans; Charles H. Mayo, Rochester, Minn.; Lewis S. McMurtry, Louisville, Ky.; John B. Murphy, Chicago; Robert E. Noble, Washington; Albert J. Ochsner, Chicago; Charles A. Porter, Boston; Charles A. L. Reed, Cincinnati; Emmet Rixford, San Francisco; Hubert A. Royster, Raleigh, N. C.; George E. de Schweinitz, Philadelphia; Henry Sewall, Denver; Richard P. Strong, Cambridge, Mass.; William S. Thayer, Baltimore; Albert Vander Veer, Albany, N. Y.; Victor C. Vaughan, Ann Arbor, Mich.

The committee organized in Chicago on April 14, elected officers and an executive committee, which on April 26 met in Washington and presented to President Wilson the following memorandum.

"We, the undersigned, acting as a committee of the medical profession appointed by the joint

action of the presidents of five national societies, to wit: the American Medical Association, the American Surgical Association, the Congress of American Physicians and Surgeons, the Clinical Congress of Surgeons of North America, and the American College of Surgeons (having an aggregate membership approximating 70,000 medical men), have the honor to present our greetings and to tender to the Federal Government our services toward the medical welfare of the Army and Navy, being prompted to do so by the following considerations:

1. In times of peace as well as in times of war, the medical profession has always held itself in readiness, out of a spirit of patriotism and coöperation, to serve the best interests of the Federal Government.

2. The European war, especially during the first six months, demonstrated a greater need both of medical supplies and of more efficient organization of medical resources, in connection with military and naval activities, than was formerly deemed adequate or necessary.

3. Every soldier and sailor in the service of the Federal Government is entitled at all times to protection in sanitary matters, and to proficient medical and surgical care.

Prompted, therefore, by these considerations, this committee respectfully offers its services in coöperation with the existing medical agencies of the government. Among the services for which at this time the committee specifically tender their coöperation, in conjunction with existing facilities of the Army and Navy for such purposes, are:

1. To establish, through the membership of the above-named medical organizations and their affiliations with local medical societies of the states and territories, an organization that would be in a position to make a comprehensive survey of the medical resources of the country.

2. To make a complete invoice of such resources available in peace and in the emergency of war. This invoice would include not only the names of men available for field or home duty who are trained in the specialties of medicine, surgery, and sanitation, but it would also include in minute detail for each community the equipment of the institutions with which these men are connected, such as hospital facilities, buildings available for hospital use, facilities for transporting wounded men, food supply and drug supply on hand and available, lists of trained nurses and other persons essential for hospital work, etc.

3. To aid in the care of the sick and wounded and the elimination of preventable diseases.

We would respectfully submit that thorough organization of the national civilian and reserve medical resources is of primary importance in the proper preparedness of the country.

For the accomplishment of these ends we desire unreservedly to offer our services."



This offer of service was accepted by the President. The committee completed its organization by adding to its numbers as honorary members the surgeons general of the three national medical services and a half dozen associate members, among whom may be noted Dr. Eugene H. Smith, dean of the Harvard Dental School. Subordinate committees have also been appointed in every state, the Massachusetts committee consisting of the following members:

John B. Blake, Chairman, Boston; Samuel B. Woodward, Worcester; Walter L. Burrage, Boston; Lincoln Davis, Boston; Homer Gago, Worcester; Robert B. Greenough, Boston; Roger I. Lee, Cambridge; Robert W. Lovett, Boston; R. H. Seelye, Springfield.

The immediate duties which the committee purposes specifically to undertake, are the following:

"A. To aid the Medical Department of the United States Army and Navy by making a comprehensive inventory of the especial qualifications of individual civilian physicians throughout the country.

"B. To cooperate with the National Committee of the American Red Cross, in bringing that organization up to the highest standards of medical ideals and to aid in the organization of Red Cross units throughout the country.

"C. The activities of the near future will include a very practical inventory of all civilian medical resources.

"D. Research work and careful investigation along many lines relating to the subject of efficient medical preparedness."

The first report of the committee was issued in Chicago on June 30. Its first step is the selection in various parts of the country of 21,000 physicians who, it is estimated, should be sufficient to care for an army of 3,000,000 men, on the European basis of 7 physicians for each 1000 enlisted men. The plan calls for the selection of physicians by each state on the ratio of 200 physicians to each million of population. To further this end, the committee will endeavor to interest the profession in the desirability of applying for commissions in the medical reserve.

"By a mutual understanding between the National Committee of American Physicians for Medical Preparedness and the National Committee of the American Red Cross, and by an interlocking arrangement of National, State and Local Committees, the former organization has determined to cooperate with the Red Cross in raising its civilian and military work to the highest point of efficiency and in organizing a

considerable number of Red Cross Hospital units, in strict accord with the most recent advances and the highest ideals of medicine. By a Presidential proclamation dated August 22, 1911, the Red Cross was made, substantially, an agency for the organization of a reserve for the medical services of the army and navy, and the units organized by it pass, in time of war, into the medical service of the military forces."

## NATIONAL BOARD OF MEDICAL EXAMINERS.

THE obvious desirability of a standard medical examining body for the entire United States and its territories, led, in 1915, to the foundation by the late Dr. W. L. Rodman, then president of the American Medical Association, of the National Board of Medical Examiners, a voluntary organization whose members were selected from the medical corps of the United States Army, Navy and Public Health Service, from the Federation of State Examining Boards, from other medical organizations and from representative physicians throughout the country.

The Board, as originally constituted, consisted of the following fifteen members:

Surgeon-General W. C. Braisted, U. S. N., President.

Dr. W. L. Rodman, Secretary.

Colonel Louis A. LaGarde, U. S. A., Ret., Treasurer.

Surgeon-General W. C. Gorgas, U. S. A.

Surgeon-General Rupert Blue, U. S. P. H. S.

Medical Director E. R. Stitt, U. S. N.

Assistant Surgeon-General W. C. Rucker, U. S. P. H. S.

Dr. Herbert Harlan, Federation of State Medical Examining Boards.

Dr. Isadore Dyer, New Orleans, La.

Dr. Victor C. Vaughan, Ann Arbor, Mich.

Dr. Henry Sewall, Denver, Col.

Dr. Louis B. Wilson, Rochester, Minn.

Dr. E. Wyllys Andrews, Chicago, Ill.

Dr. Horace D. Arnold, Boston, Mass.

Dr. Austin Flint, New York, N. Y.

Upon the death of Dr. W. L. Rodman on March 8, 1916, Dr. W. L. Biering of Des Moines, Ia., was, on June 13, elected to the Board and Dr. J. S. Rodman has since succeeded to the office of secretary. It is intended that the permanent organization of the Board



shall consist of the three surgeons general, of one representative from each of the government services, of three representatives from the state examining boards and of six members chosen at large from the profession by the National Board of Medical Examiners. The headquarters of the Board is to be at Washington, D. C.

The purpose of the National Board of Medical Examiners of the United States is to establish a standard of examination and certification of graduates in medicine through which, by the coöperation of individual boards of medical examiners, the recipients of certificates of the National Board of Medical Examiners may be recognized for licensure to practice medicine. The policy of the Board is to conduct its examinations on a broad scientific basis of such a high, yet practicable, standard that the holders of its certificates will receive universal recognition. The independence of the Board is furthered by the financial and moral support of the Carnegie Foundation.

The first examination to be held by this Board will begin at the Army Medical Museum, Washington, D. C., on October 16, 1916, and will cover a period of one week. No charge will be made for the examination, but a registration fee of \$5.00 is required. Further particulars may be obtained from the secretary, Dr. J. S. Rodman, 2106 Walnut Street, Philadelphia.

The requirements for admission to this examination are the satisfactory completion of a four-year high school course; two years of acceptable college work, including physics, chemistry, biology and one modern language; graduation from a medical school of Class A in the American Medical Association classification; and a year spent as interne in an acceptable hospital or laboratory. The examinations will be conducted primarily by members of the Board and will be written, oral and practical. Examinations will also be held at the Army and Navy Medical School and at the Hygienic Laboratory of the Public Health Service. The examination will cover the following subjects which will be numerically rated as follows:

1. Anatomy .....	100
2. Physiology .....	75
3. Chemistry and Physics .....	75
4. Pathology and Bacteriology.....	100
5. Materia Medica, Pharmacology, and Therapeutics .....	75
6. Medicine .....	200
7. Surgery .....	200

8. Obstetrics and Gynecology ....	100
9. Hygiene and Sanitation.....	50
10. Medical jurisprudence.....	25

Total .....1000

An average of 75% is required as a passing grade and any candidate who receives a mark below 50% in one subject, or below 65% in two subjects, fails. Candidates failing at the first examination may register for the second examination at the end of the year, but a third examination will not be allowed. Candidates who have been successful and are approved by the Board will be granted certificates, which are not licenses to practice medicine and will not exempt the holders from complying with the legal requirements of the states in which they desire to practice. These certificates, however, will be evidence of high attainment in medical knowledge and it is believed that they will soon be accepted by state boards of registration as evidence for licensure without further examination.

The formation of the National Board of Medical Examiners and the plans for its work represent an attempt to accomplish unofficially the standardization of medical registration throughout the United States which has so long been needed and desired by enlightened practitioners. The movement has already received the endorsement of the American Medical Association and numerous other medical organizations. It is sincerely to be hoped and expected that the successful work of this board may soon win permanent recognition and result in the elimination of the duplicated effort and anomalous diversity of standards resulting from present methods of state examination.

## MEDICAL NOTES.

THE HISTORY OF A TYPHOID CARRIER.—The daily press thus chronicles the history of a typhoid carrier in New York State: "The carrier, Mr. C—, is fifty-five, has a dairy farm in X—, and his milk is sold by others in his city. About sixteen years ago he had typhoid fever, has been in good health ever since and does the work on his farm, including milking, assisted by his son and family.

"At various times suspicion pointed to this milk supply, but nothing definite could be proved against it. In 1913 a new health officer was appointed. He followed up each typhoid



outbreak and found always four to six dairy farms, C's among them, and tests were made among these every time. In 1914 an outbreak was traced to ice cream—milk from C—, but it was thought that the water in which the cans were washed was contaminated. In 1915 an outbreak was defined as possibly due to a few farms, C's among them, and tests were made of all the dealers. Delay in examining the specimens caused the tests to be worthless. C— was warned not to sell milk in N—. Later in 1915 another outbreak occurred, traced to milk of a dealer, P—. There was no trouble on his farm, but it was found that his own supply being short, he was quietly getting about eighty quarts a day from C—. C— was again tested and found to be a carrier. Meanwhile the water supply had been treated and many other possible causes discussed.

"It is an interesting story, showing how insidious the typhoid bacillus is and how the health officer must be a detective as well as a sanitarian."

**AMERICAN ACADEMY OF MEDICINE.**—At the annual meeting of the American Academy of Medicine in Detroit, Mich., on June 12, the following officers were elected for the ensuing year: President, Dr. Jacob E. Tuckerman, (Cleveland); vice-presidents, Dr. Frederick L. Van Sickle, Olyphant, Pa., and Dr. Ray Connor, Detroit, and secretary, Dr. Thomas W. Grayson, Pittsburg.

#### PREVENTION OF FOURTH OF JULY FATALITIES.

It is now over ten years since the beginning of the movement for the so-called safe and sane observation of the Fourth of July, a movement whose progress has been largely aided by the influence of the *Journal of the American Medical Association*, especially in the matter of the prevention of tetanus. The following statistics are the best evidence of the success of this movement. In the year 1899 there were twenty-one deaths in New York City from tetanus following pistol and firecracker injuries. In 1903 there were in the entire United States 415 cases of such injuries. In 1905 the total number of cases was reduced to 104, but of these 87 died. In 1906 there were 89 cases and 75 deaths, of which 10 were in New York City. In 1909 the number of cases rose again to 150 with 126 deaths, of which 7 were in New York City. Since that time the number of cases and deaths has rapidly declined. In 1914 there were only 3 cases, all of which, however, proved fatal, and in 1915 there were 3 cases and 1 death. This rapid decline represents the diffusion, not only among the public but among the profession, of knowledge about the danger of blank cartridge and firecracker wounds, the best method of their treatment, and the possibility of preventing the development of tetanus from such injuries.

**MEDICINE IN CHINA.**—As significant of the present status of medical education in China, the daily press reports as follows a recent conference of the National Medical Association of China, the president of which is F. C. Yen, M.D., of Changsha:

"There were 55 delegates in attendance at this meeting in Shanghai, representing sections separated by about 1200 miles along the country adjacent to the coast from Canton and Hong Kong north to Mukden and Kirin. The Chinese army and navy were also represented.

"In view of the general Western ignorance of the China of today, it is interesting to note that the plaint of Dr. Wu Lien-Teh was the absence of compulsory notification of infectious fevers, and he urged the more thorough adoption of new and progressive ideas. Some of the titles of papers suggest that the Chinese are considering the questions of the day in much the same way as do the Caucasians and with intelligence and knowledge. The 'Medical Education of Nurses' was discussed by Dr. Lujien Tsao of Nanking, a woman graduate of Philadelphia medical schools; while Dr. S. P. Chen urged the reorganization of the medical schools of the country. He proposed the establishment of a central board of control, the reorganization of existing schools, provision for post-graduate study and the equipment of hospitals throughout the country. 'Health as a Factor in National Strength' was the timely title of a paper presented by Dr. Peter, secretary of a Chinese public health council."

**AN IMPORTANT LEGAL DECISION.**—Before Judge William I. Grubb in a United States court recently, a jury determined that novocaine as a synthetic product does not come within the prohibitory provisions of the Harrison Anti-Narcotic Law, inasmuch as it is not a derivative or compound of opium or coca leaves. This decision was rendered in a suit of protest brought by a drug company to recover the tax which had been paid under a ruling of the treasury department.

#### EUROPEAN WAR NOTES.

**APPEAL OF AMERICAN RELIEF COMMITTEE.**—The American Relief Committee, auxiliary to the American Relief Committee in Berlin for Widows and Orphans of the War, has recently issued the following appeal for funds for the continuation of its work. The honorary chairman of this committee is His Excellency, Charles S. Whitman, Governor of New York, and the honorary vice-chairman, His Honor, John Purroy Mitchell, the Mayor of New York City. The chairman is the Honorable George B. McClellan, former mayor of New York, and the treasurer, to whom all contributions should be sent, is John B. Crippins, Esq., 30 East 42d street, New York. Among the leading members of the committee are Nicholas Murray Butler



of New York, President of Columbia University, Henry S. Pritchett of New York, President of the Carnegie Foundation, Mr. Henry W. Taft of New York and the Honorable Charlemagne Tower of Philadelphia. The appeal of this committee is as follows:

"Ever since the outbreak of the war when it became evident that the great struggle was to impose immeasurable suffering upon all nations, Americans living in Berlin have been trying to do what they could to alleviate the situation. An American Relief Kitchen, organized by the American Chamber of Commerce, with Mrs. James W. Gerard as president, was opened, and distribution of food was daily made to hundreds of those in immediate want. At the same time coal and clothing were given as freely as circumstances permitted. The Kitchen was entirely non-partisan and made no distinctions as to nationality.

"This and other endeavors to minister to the all-prevailing misery have been highly appreciated in Germany, and there have been warm expressions of gratitude from many sources. But with the unlooked for proportions to which the war has grown, all ordinary relief methods have broken down, while the demand for help has become more urgent than ever. The number of persons requiring assistance, the constantly multiplying appeals of widows and orphans have brought about a condition calling for redoubled efforts.

"Americans in Berlin have given freely and without stint; but their resources, already straitened by the interruption of commerce incident to the war, have been nearly exhausted. The Relief Kitchen, after nine months of noble work, has been forced to close its doors on account of lack of funds, and that at the very time when its activities were most essential. Indeed, all humane exertions which resident Americans have felt called upon to undertake are in danger of extinction.

"Rather than let this all-important work go by default and thus allow America, so active elsewhere, to appear to neglect the call of humanity in this one field, the American Relief Committee in Berlin for Widows and Orphans of the War, under the patronage of Hon. James W. Gerard, the American Ambassador, and Her Highness, the Princess of Hohenlohe, has been formed and has appealed to their fellow-citizens at home to assist them.

"The American Auxiliary Committee has come forward in response to this appeal, and hopes to raise a substantial sum, which will be forwarded without deductions of any kind to the American Relief Committee in Berlin, and expended by the Red Cross of Berlin in their relief work among widows and orphans of the war.

"Necessary clerical expenditures already have been provided for by the members of the Committee.

"The Committee cannot handle food and clothing; but money not only will relieve in some measure the very real suffering of non-combatants, but will also prove to the German people, so long friendly to America, that America, on her part, is willing to give of her plenty, wherever humanity demands."

**WAR RELIEF FUNDS.**—On July 14 the totals of the principal New England relief funds for the European War reached the following amounts:

Belgian Fund .....	\$132,945.12
Allied Fund .....	123,912.00
French Wounded Fund .....	99,146.80
Army Huts Fund .....	66,739.60
French Orphanage Fund .....	57,397.05
Armenian Fund .....	54,892.77
Polish Fund .....	39,052.37
Facial Hospital Fund .....	23,135.51
Italian Fund .....	20,592.34
Permanent Blind Fund .....	1,003.70

#### MEXICAN NOTES.

**BASE HOSPITALS AT THE FRONT.**—Report from San Antonio, Texas, on June 30, states that two large base hospitals capable of caring for 500 patients each have been established in that city and at Fort Bliss. A smaller base hospital has also been established at Douglas, Ariz., and there are to be others at Fort Crockett, Galveston, Eagle Pass, Laredo and Nogales. Numerous camp hospitals have been established along the frontier.

**FIELD HOSPITALS AND AMBULANCE COMPANIES.**—There are at present in the United States Army seven field hospitals and seven ambulance companies. Steps have already been taken by the Government to equip each field hospital with a motor truck and all field ambulance companies with motor ambulances.

**BROWNSVILLE MILITARY HOSPITAL.**—Report from Brownsville, Texas, on June 27, states that funds are being raised for the enlargement and maintenance of the Brownsville Military Hospital. The National Red Cross has given \$1000 and Major Henry L. Higginson of Boston \$10,000 for this purpose. When completed the hospital is to contain 300 beds.

**SECOND MASSACHUSETTS FIELD HOSPITAL COMPANY.**—The first Massachusetts Field Hospital Company is already at the front with the mobilized Massachusetts Militia. A second field hospital and ambulance company has been organized by Dr. Charles R. Morgan of Boston, who will be its captain, with Dr. W. H. Young and Dr. H. F. Parker as lieutenants. This company has an enrollment of 67 men, six officers and nine members of the quartermaster's department. Its members have already taken the Federal oath, been inspected and gone to Framingham for encampment prior to departure for Mexico. Dr. Morgan served with



the medical department of the United States Navy during the Boxer uprising in China in 1900 and in the Philippines in 1901 and 1902. He served for a time as assistant surgeon in the navy and for three years has been first lieutenant in the medical corps of the Massachusetts National Guards.

**SANITARY ORGANIZATION OF THE ARMY.**—Report from Washington, D.C., on July 3, states that Lieutenant Colonel Edward L. Munson and Majors R. B. Miller and William N. Bispham of the United States Army Medical Corps have left that city for San Antonio, Texas, to assume charge of the sanitary organization in connection with the National Guard camp at the front. It is also announced that the United States War Department will furnish sanitary equipment to all National Guard organizations, including material for ambulance companies and field hospitals. The Department will purchase four hundred motor ambulances and large quantities of bedding and other hospital supplies. New medical supply depots have been established at El Paso and San Antonio. Existing hospitals have been enlarged and additional accommodations will be built. Orders have been placed for 200,000 mosquito bars, and it is intended that every militia soldier who has not already been vaccinated against smallpox and typhoid shall be compelled to receive this protection.

**MASSACHUSETTS DENTAL CORPS.**—Adjutant General Cole of Massachusetts has called attention to the desirability of organizing and sending to El Paso, for service with the Massachusetts militia, a dental corps to consist of six qualified dentists. It is expected that the Governor will issue the necessary authorization for the establishment of such a corps.

**MASSACHUSETTS MEXICAN RELIEF FUND.**—Two funds have already been initiated in Massachusetts to relieve the stress incident to the Mexican situation. The first is that of the Massachusetts Volunteer Aid Association, whose purpose is to relieve distress among the families of Massachusetts soldiers, and to furnish supplies of relief to the soldiers themselves. On July 14 the total of this fund amounted to \$66,897.50. The other fund is that of the Special Aid Society for American Preparedness, which on the same date reached a total of \$9,423.40.

On July 10 the Massachusetts Volunteer Aid Association issued the following second appeal for contributions to its fund:

"On June 26, Governor McCall summoned to the council chamber certain citizens, men and women of our State, and requested them to organize the Massachusetts Volunteer Aid Association for the purpose of helping the women and children of the men called to military service by the President of the United States, who receive no adequate assistance from their em-

ployers, and to assist these men in every needed way.

"The committee of citizens summoned has organized as directed and has taken up the work with diligence and zeal. Everyone has been invited to become a member of the Association by subscribing \$1 or more and the committee is now engaged in giving help, acting only after the most careful inquiry.

"Subscriptions, large and small, have been invited, and some money has been raised, but not nearly enough to carry on the work which has proven to be necessary. As many families are actually without food and money, subscriptions are needed immediately.

"So long as our men are in service, war or no war, many of their families need help, and the committee asks our citizens to send their subscriptions at once to George C. Lee, treasurer, 50 State street, Boston.

"HENRY L. HIGGINSON,

"DANIEL G. WING,

"WILLIAM A. GASTON,

"PHILIP STOCKTON,

"AUGUSTUS P. LORING,

"WILMOT R. EVANS,

"HENRY PARKMAN,

"W. CAMERON FORBES,

"JAMES M. PRENDERGAST,

"W. MURRAY CRANE,

"FRANK G. WEBSTER,

"A. C. RATSHESKY,

"Finance Committee."

**BASE HOSPITAL AT THE MAYO CLINIC.**—On July 10, it was announced that Colonel Jefferson R. Kean of the United States Army Medical Corps, Director General of military relief of the American Red Cross, had received at the American Red Cross Headquarters in Washington, a letter from Dr. William J. Mayo of Rochester, Minn., offering to organize a base hospital whose personnel and equipment should be furnished by the Mayo Clinic. The number of medical officers in this hospital would be 23, the number of beds would be 500, and the estimated cost of equipment, \$25,000.

**MASSACHUSETTS BASE HOSPITALS.**—The Massachusetts branch of the American Red Cross has announced its intention of raising funds to provide full war equipment for the three base hospital units to be established at the Boston City, Massachusetts General and Peter Bent Brigham hospitals in this city. A committee has been appointed and has issued an appeal for the sum of \$200,000 for this purpose. In addition, a fourth base hospital is to be established in western Massachusetts, for which further subscriptions of \$50,000 are requested by another committee from that part of the State. On July 14 a total of \$67,922.00 had already been raised towards the former sum. Each of the four base hospitals thus provided is to be equipped with



five hundred beds and four motor ambulances, and each will have a total complement of 196 physicians, surgeons and attendants. In addition, the committee purposes to establish an ambulance corps as an adjunct to each hospital, at a cost of \$30,000, and, in the event of war, a hospital train costing \$15,000 to bring troops from the front. A hospital ship is another possibility under consideration.

**MASSACHUSETTS FIELD HOSPITAL FUND.**—The following extract from a recent letter to a Boston physician by a lieutenant of the Massachusetts Field Hospital Company, No. 1, now on service in Camp at Fort Bliss, El Paso, Texas, is self-explanatory:—

"Do you think you could get the Massachusetts Medical Society interested enough in us to give us a little aid? We are suffering for want of transportation facilities. We have no horses, but expect to become motorized at some time,—when, I don't know. We have been promised by some Back Bay ladies a portable kitchen and a motor ambulance. What we most need now is a couple of motor-cycles with sidecars, to get about quickly and run errands with. As we are so far from town, hours are wasted in getting about on a car service crippled by a strike now going on. I ask you, thinking perhaps you could start something to help us."

In accordance with this appeal, and after conference with officers of the Massachusetts Medical Society, it is proposed to establish a fund to purchase the needed equipment. Contributions to this fund, from physicians and others, are earnestly solicited, and should be sent to Dr. Samuel B. Woodward, 58 Pearl Street, Worcester, or to Dr. Paul Thorndike, 14 Marlborough Street, Boston.

#### BOSTON AND NEW ENGLAND.

**THE WEEK'S DEATH RATE IN BOSTON.**—During the week ending July 15, 1916, there were 199 deaths reported, with a rate of 13.65 per 1000 population, as compared with 197 and a rate of 13.69 for the corresponding week of last year. There were 31 deaths under 1 year, as compared with 35 last year; and 53 deaths over 60 years of age, against 53 last year.

During the week the number of cases of principal reportable diseases were: diphtheria, 35; scarlet fever, 10; measles, 165; whooping cough, 20; typhoid fever, 4; tuberculosis, 45.

Included in the above were the following cases of non-residents: diphtheria, 10; scarlet fever, 3; typhoid fever, 1; measles, 2; tuberculosis, 3.

Total deaths from these diseases were: diphtheria 1; measles, 5; tuberculosis, 21; whooping cough, 1.

Included in the above were the following deaths of non-residents: diphtheria, 1; tuberculosis, 2.

**DENTAL CLINIC AT BOSTON DISPENSARY.**—On Monday of last week, July 10, a new dental clinic was opened at the Boston Dispensary in

charge of Dr. Kurt H. Thoma of the Harvard Dental School. Nominal fees are charged to cover the cost of material and of administration. The clinic is to be held on Monday and Friday at 7 p. m.

**BOSTON BABY HYGIENE ASSOCIATION.**—On July 6, the Boston Baby Hygiene Association issued a statement of its work during the preceding month and half-year. During the first six months of the year 3370 babies were under supervision by the Association, and over 2000 of these were under care in the month of June, an increase of 113 over June, 1915. Contributions to the sum of \$300 have been received towards the opening of a new station at Grove Hall. Seventeen nurses are now employed by the Association, and an extra nurse is maintained at the South Station by the Federation of Women's Clubs. Dr. J. Herbert Young, director of the Association, announces the appointment of the following conferent physicians:

Dr. Edwin A. Meserve, Dr. N. M. Scott, Dr. Jeremiah A. Green and Dr. A. B. Lyon.

**HOSPITAL BEQUEST.**—The will of the late Marion C. Goodwin, filed recently at the Probate Office, contained a bequest of \$500 to the Children's Hospital, Boston.

### Miscellany.

#### RÉSUMÉ OF COMMUNICABLE DISEASES FOR MAY, 1916.

THE outstanding features of the communicable disease situation for May are the unusually high mortality from measles, the low incidence of typhoid fever, and the sharp outbreak of septic sore throat in Watertown.

**Prevalence.** The total number of cases of communicable diseases reported for May is about the same as for the corresponding month last year. It is considerably above the five-year average for the month of May. The case incidence per hundred thousand population for May, 1916, was 218, while the average for the five-year period (1910-1914) was 190. This increase above the average is due to the unusual prevalence of measles and the better reporting of whooping cough. Measles continue to be the most important single factor in our communicable disease reports. It is prevalent in every part of the state.

**Distribution.** The distribution of the various communicable diseases is of interest.

**Measles.** Springfield and Brockton remain the centers of greatest intensity in this infection. However, during May the following cities and towns have exceeded their endemic index. Endemic index signifies the average for five years of reported cases exclusive of



epidemics. This index is applied to each city and town for each month for every communicable disease.)

The numbers in the first column indicate the endemic index for that city or town. The numbers in the second column indicate the cases reported during the current month.

	Endemic Index.	Current Year.
Abington .....	2	43
Adams .....	0	31
Amesbury .....	1	12
Attleboro .....	1	79
Avon .....	0	37
Bridgewater .....	4	44
Brockton .....	39	451
Carver .....	0	14
Chatham .....	0	12
Chelmsford .....	0	22
Chilcopee .....	7	58
Clinton .....	2	43
Duxbury .....	0	16
E. Bridgewater .....	1	34
Erving .....	0	32
Essex .....	1	9
Fall River .....	11	42
Fitchburg .....	16	55
Frammingham .....	24	37
Hanson .....	0	15
Hanover .....	0	22
Hardwick .....	0	23
Holbrook .....	1	16
Lowell .....	105	182
Ludlow .....	0	28
Lynn .....	21	42
Mansfield .....	2	14
Marshfield .....	0	44
Mendon .....	0	42
Methuen .....	2	16
Montague .....	1	12
Needham .....	0	11
Newton .....	81	168
Palmer .....	1	12
Rockland .....	0	42
Rockport .....	0	9
Shirley .....	0	13
Springfield .....	46	405
Tyngsboro .....	0	21
Ware .....	0	14
Wareham .....	0	28
Warren .....	0	35
Westfield .....	3	21
Whitman .....	2	35
Worcester .....	90	331

*Scarlet Fever* shows a decrease in amount both in comparison with May, 1915, and with the average for the five-year period. The most important focus of infection seems to be at Quincy. From the investigations of the State District Health Officer, the disease appears to be being spread by mild and ambulant cases. The following cities and towns have exceeded their scarlet fever endemic index for the month of May:

	Endemic Index.	Current Year.
Amesbury .....	1	8
Bridgewater .....	1	7
Cambridge .....	11	21
Clinton .....	1	8
Dalton .....	0	9
E. Longmeadow .....	1	8
Holyoke .....	14	40
Lexington .....	0	6

	Endemic Index.	Current Year.
Milton .....	1	12
Newburyport .....	1	6
North Adams .....	0	7
Northampton .....	4	12
Peabody .....	1	11
Quincy .....	8	42

*Whooping Cough* has shown a slight increase in the number of reported cases as compared with May, 1915. The considerable increase noted, as compared with the five-year period, is doubtless due to the better reporting of this disease. The following cities and towns have exceeded their whooping cough endemic index for May:

	Endemic Index.	Current Year.
Amesbury .....	0	7
Braintree .....	5	26
Brockton .....	7	66
Cambridge .....	9	45
Canton .....	1	9
Chelsea .....	2	14
Danvers .....	0	14
Dudley .....	0	24
Fall River .....	3	26
Fitchburg .....	2	21
Haverhill .....	4	23
Lawrence .....	12	21
Lexington .....	0	10
Medford .....	3	13
Wellesley .....	0	35

*Diphtheria* shows a gratifying decrease in amount. The case incidence per hundred thousand is considerably lower as compared with May, 1915, and also as compared with the five-year period. There are at the present time no important foci of diphtheritic infection in the state. However, the following cities and towns have exceeded their endemic index for diphtheria for the month of May:

	Endemic Index.	Current Year.
Amesbury .....	1	7
Brockton .....	9	26
Everett .....	4	10
Fitchburg .....	4	15
Lawrence .....	9	27
Oxford .....	0	7
West Springfield .....	0	5

*Tuberculosis.* The looked-for increase in the number of reported cases of this disease through the newly-established dispensaries is disappointing. During May there was a decrease in the number of reported cases, both in comparison with the same month last year and with the five-year period. It had been hoped that with the dispensaries in good working order that we would be getting fuller reports of cases. The subject is now being taken up through the State District Health Officers.

*Typhoid Fever.* A remarkably low incidence of typhoid fever is to be noted. Reports for the month show a decreased incidence, both in comparison with May, 1915, and with the five-year period. It is also to be noted that the fatality rate for this disease more nearly approached normal during last month.



**Mortality.** As usual, the most important single factor in the month's mortality is tuberculosis. The most striking factor, however, is the fact that there were 40 deaths from measles during the month. These deaths were distributed as follows: Boston 12, Brockton 7, Worcester 7, Springfield 4, Chicopee 2, Fall River 2, and 1 each from Attleboro, Cambridge, Lawrence, Lynn, New Bedford and Woburn. This is a striking commentary on the generally accepted belief that measles is not a "dangerous disease." Diphtheria, with 39 deaths, is a striking feature, even though it is below the average. We do not appear to be making satisfactory progress in controlling the mortality from this disease. Scarlet fever and whooping cough combined to cause 32 deaths, while typhoid fever was given but eight times as a cause of death.

**Epidemics.** During the course of the month there was a sharp outbreak of what proved to be septic sore throat in Watertown. Physicians of that town were sending to the local board of health laboratory cultures for a severe type of sore throat. The early diagnosis was that of a staphylococcal infection; later developments have proved that it was a hemolytic streptococcus. Investigations showed that all of the families were taking milk from the same milkman. An inspection of the dairies on this producer's route revealed a single cow with an antrophied quarter from which was obtained a small amount of pus. A special bacteriological examination is under way upon orders from the local board of health. The cow was slaughtered; the entire milk supply has been pasteurized.

Three additional cases of anthrax were reported from Woburn during the month. All the cases reported to date have been handlers of Chinese hides.

The diphtheria situation at the Shirley Industrial School for Boys is improved. There have been no clinical cases for some time, and the few remaining boys with positive cultures are isolated in a camp remote from the rest of the school.

**Rare Diseases.** Trachoma was reported from Boston (4), Brookline (1) and Lowell (1). Cerebro-spinal meningitis was reported from Boston (3), Methuen (2), Walpole (2), Arlington (1), Ipswich (1), Northampton (1), Somerville (1) and Springfield (1). Malaria was reported from Boston (3), Marblehead (1) and Worcester (1). Pellagra was reported from Worcester (2), Boston (1), Northampton (1), Taunton (1) and Winchester (1). Septic sore throat was reported from Boston (7), Fall River (4), Somerville (3), Chelsea (1), Chicopee (1), and Westfield (1). Dog-bite was reported from Boston (12), Brockton (7), Worcester (7), Springfield (4), Chicopee (2), Fall River (2), and one case each from Attleboro, Cambridge, Lawrence, Lynn, New Bedford and Woburn.

## Correspondence.

### THE "UNPREPAREDNESS" OF THE MEDICAL PROFESSION.

Boston, July 7, 1916.

Mr. Editor:

In the JOURNAL of July 6, in an editorial on "Medical Aspects of the Mexican Situation," you make the following statement:—

"The occasion and opportunity have arrived when the medical corps of the army and navy, the medical officers of the national guard, and in the event of extensive hostilities, civilian members of the profession will either demonstrate or fail to demonstrate their fitness to deal competently and creditably with the medical urgencies that arise in time of war; and it is most earnestly to be hoped and expected that this demonstration will be in every respect a credit to the American profession." (The italics are mine.)

The natural pride which you take in the medical profession has led to a statement which, in my opinion, is not justified. Let us look a few unpleasant facts in the face.

I believe that, in the event of extensive hostilities, at the present time the medical corps of the army and navy and of the national guard would be found entirely inadequate in numbers, and that the civilian members of the profession would be unable to acquit themselves in such a way that the profession should be proud of them. I know that they would all acquit themselves with great credit in one sense—in their earnest endeavor to accomplish the impossible; but the accomplished results would hardly be creditable.

In the same number of the JOURNAL, page 32, under the head of "Deficiencies of the Medical Service," you call attention to the fact that "On a war footing of 1600 men, each regiment has but four surgeons, who, under conditions of field service in war, are obviously insufficient. In all foreign countries the allowed ratio is seven surgeons to 1000 men." Yet the European War has shown that the allowance of surgeons abroad almost double that in this country—has proved inadequate to meet the demands of modern warfare. The inadequate number of our surgeons is not the fault of the medical corps of the army and navy, but of the Congresses that have refused to make proper provision for the medical care of our soldiers.

If we needed any proof of the inadequate number of medical officers provided for the army, it is to be found in the recent mobilization of the militia. The medical officers have been overtaxed with the duties of mustering in 100,000 men from the militia. What would happen "in the event of extensive hostilities," when we would need in addition a volunteer army of 500,000 or 1,000,000 men?

In such an event they must, of course, turn to the civilian members of the profession, but how many of us know anything about the duties of medical officers? And there would be no available army officers to teach us. This fact has been brought home to me by the present difficulties of the Harvard Graduate School of Medicine in trying to give the course in military medicine which is announced for July.

Recognizing the importance of preparedness on the part of the medical profession, the Graduate School decided last November to inaugurate instruction in military medicine. Major Chamberlain, of the medical corps of the army, was selected by Surgeon General Gorgas to give this instruction, but he could not be sent to Boston until July. All plans were completed for a course of daily lectures to begin July 5, when, at the last moment, it was found that Major Chamberlain could not be spared from the army or the Mexican border. Fortunately, we had already



received his typewritten lectures, and it was thought that some other medical officer of the army could be found to deliver these lectures. Enquiry showed, however, that *not a single officer of the medical corps of the army or of the militia could be spared for this purpose*, so overwhelmed are they by the duties of mobilization and recruiting.

Let us ask ourselves seriously, if we are interested in having the medical profession acquire itself creditably "in the event of extensive hostilities," what would have happened if the United States had found itself suddenly confronted with a war with a first-class power instead of with a possible war with Mexico. Unless the medical profession could creditably meet such an emergency, it is not "prepared" as it ought to be.

It is probable that through typhoid inoculation we should make a better record in one respect than we did in the Spanish-American War, but are we any better prepared in other respects? The medical profession cannot be proud of its record in that war. The records show officially that the incidence of typhoid fever was 88 per thousand, but a board of investigation, consisting of Reed, Vaughan and Shakespeare, came to the conclusion that the rate should have been stated as 192 instead of 88 per thousand. Compare this with the record in the Civil War of 62 per thousand,—and let the profession hang its head in shame for its unpreparedness for military duty in 1898. Are we civilians essentially better prepared in 1916? My answer is "No."

I believe it is the duty of medical schools to include military medicine in the curriculum, that it is the duty of graduate medical schools to organize courses in this subject for members of the profession, and that it is the duty of all physicians in civil life, who might be needed in the emergency of war, to learn at least the rudiments of the duties of a medical officer.

The Harvard Graduate School of Medicine began its course July 5, as announced, and will give a creditable course in military medicine in spite of the handicaps. It will offer similar instruction on a more extensive scale next fall.

Yours very truly,

H. D. ARNOLD.

#### SICKNESS SURVEY OF BOSTON.

Boston, July 8, 1916.

Mr. Editor:

For the week beginning July 17 there is to be made, by the Metropolitan Life Insurance Company, a "sickness survey" of Boston; like the survey made in Rochester a while ago.

There can be no question of the desirability of the exact knowledge of morbidity to be gained in this way, and while Dr. Frankl is running the affair, some co-operation by the profession will help. This need only take the form of answering inquiries as to diagnosis in doubtful cases, in reply to letters of inquiry that will come through Dr. Mahoney of the Health Board.

The profession may rest assured that this survey is intended only to get knowledge of actual conditions,—very essential these days, in view of the probably impending sickness insurance laws, in shaping which medical men must do their share, if they wish for a proper status and proper treatment when such laws become effective.

Very truly yours,

FREDERIC J. CORTON, M.D.

#### RESIGNATIONS.

PROFESSOR SELSKAR M. GUNN has resigned as director of the Division of Hygiene of the Massachusetts State Department of Health.

DR. EMERY R. HAYHURST has resigned as chief of the Division of Occupational Diseases of the State Department of Health of Ohio.

#### NOTICES.

CHANGES IN THE MEDICAL CORPS, U. S. NAVY, for the week ending July 1, 1916.

June 24.

Surgeon H. C. Curl, *Alabama to Rhode Island*.

Surgeon J. S. Taylor, *Rhode Island to Alabama*.

June 26.

P. C. Cook, detached *Louisiana* to home and wait orders.

Surgeon T. W. Richards, to Military Relief Division, American Red Cross, Washington, D. C.

June 28.

Surgeon A. W. Dunbar, detached Naval Academy, Annapolis, Md., to home and wait orders.

June 30.

Assistant Surgeon C. H. Dragoo, to Naval Hospital, Newport, R. I.

NOTE: Medical Director S. F. Cones, retired, died at Cambridge, Mass., May 1, 1916.

CHANGES IN THE MEDICAL CORPS, U. S. NAVY, for the week ending July 8, 1916.

Cable from Commander-in-Chief Asiatic Fleet, June 29, 1916.

P. A. Surgeon M. A. Stuart, detached *Wilmington* to home and wait orders.

Assistant Surgeon Talmadge Wilson, detached Naval Hospital, Yokohama, Japan, to *Wilmington*.

#### BELGIAN PHYSICIANS' RELIEF FUND.

REPORT OF THE TREASURER OF THE COMMITTEE OF AMERICAN PHYSICIANS FOR THE AID OF THE BELGIAN PROFESSION FOR THE MONTH OF JUNE, 1916.

No contributions for the month of June, 1916.

Previously reported receipts,..... \$7941.86

Previously reported disbursements:

1625 standard boxes of food at \$2.20—\$3575.00

1274 standard boxes of food at 2.30.. 2930.20

333 standard boxes of food at 2.28.. 804.84

Total disbursements..... \$7310.04

Balance..... \$ 631.82

F. F. SIMPSON, M.D., *Treasurer*,  
7048 Jenkins Arcade Bldg.,  
Pittsburg, Pa.

#### RECENT DEATHS.

DR. FREDERICK W. K. VON LIBERG, a laryngologist who for some years has had expert care of the German Emperor, died in Berlin on July 9.



# The Boston Medical and Surgical Journal

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## Original Articles.

### HEMOPTYSIS AS A SYMPTOM.\*

By FREDERICK T. LORD, M.D., BOSTON.

OF the various publications which have dealt with this subject, the monographs by John Ware (On Hemoptysis as a Symptom, from the publications of the Massachusetts Medical Society, Boston, 1860) and by Stricker (Ueber Lungenblutung in der Arnee, Festschr. z. 100 jährigen Stiftungsfeier d. med. chir. Friedrich Wilhelms Inst. Berlin, 1895) are especially noteworthy. Of 329 cases of hemoptysis observed by Ware the bleeding was ascribed to tuberculosis in 190, and 62 (18%) recovered without subsequent symptoms to suggest pulmonary tuberculosis. It appears from Stricker's investigation of 900 young and strong soldiers with hemoptysis in the Prussian Army, that of 480 in whom the hemorrhage occurred without recognizable cause or after a "cold," 417, or 86%, were certainly or probably tuberculous; of 213 in whom the bleeding followed the ordinary exertion of military exercise, 176, or 82%, were ascribed to tuberculosis, and of 118 cases in which this symptom came on after more severe exertion (as in the gymnasium, in riding or in swimming), 76, or 64%, were thought to be tuberculous.

In all large series of clinical cases of hemoptysis in which an inquiry is made concerning

the proportion to be ascribed to tuberculosis, the question of the relation of a certain number to this disease must remain unanswered without an appeal to more definite data than can be accumulated on patients during life. The frequency with which hemoptysis is not followed by outspoken tuberculosis has made the interpretation of the symptom difficult, and has led to a feeling of uncertainty as to the cause, especially in those cases in which it occurs in patients with good family history, in apparent health and without attendant manifestations of tuberculosis. Although it is apparent from the well-known tendency of tuberculosis to undergo spontaneous arrest that apparent recovery, as in Ware's 62 cases, is not an assurance against this disease as the underlying cause, yet the question of the significance of hemoptysis cannot be answered with assurance without further evidence than this. Stricker's cases, in which the hemoptysis appeared to be due to certain or probable tuberculosis in diminishing percentage as the physical exertion increased, suggest the possibility that exertion itself may be a sufficient cause of the bleeding.

In the attempt to reach a more definite conclusion as to the meaning of this symptom, 549 clinical cases of hemoptysis have been reviewed, and there are included in this number those instances which have occurred at the Massachusetts General Hospital, at the Channing Home and in my private records. In addition to this group of clinical cases, 307 instances of hemoptysis with autopsy have been found in the records of the Massachusetts General Hospital. A useful division may be made between those

\* Presented at the Twelfth Annual Meeting of the National Association for the Study and Prevention of Tuberculosis, Washington, May 12, 1916.



cases in which the bleeding comes out of a clear sky, or when cough and scanty expectoration alone cloud it, and those in which the hemoptysis is but one of the symptoms of pulmonary or other disease. It is of interest also to note the probable frequency of the various causes and to inquire as to the influence of hemoptysis on the course of pulmonary tuberculosis. These matters are discussed under the headings which follow:

#### HEMOPTYSIS OUT OF A CLEAR SKY.

Excluding from consideration all cases in which the diagnosis has not been established, there are thirty instances of hemoptysis in this group. In these the hemoptysis was an initial event, unpreceded or followed by pulmonary or other symptoms or accompanied only by cough with or without scanty expectoration. In this number are included twenty clinical cases with sputum positive for tubercle bacilli at the time of the bleeding or later in their course. Other clinical cases, of which there are a considerable number with hemoptysis out of a clear sky, but in which definite proof of the cause is lacking, are left out of consideration as of undetermined origin. The ten remaining were autopsy cases and nine, of which three may be mentioned in greater detail, showed obsolete, inactive or active pulmonary tuberculosis. Thus with one exception all the proved cases in this group were tuberculous.

The three cases already referred to may be summarized as follows. One was the case of a man of 46, who entered the Massachusetts General Hospital in 1898 with a history of having coughed up a lump of blood as big as an egg twenty-four years before after rowing a race. The hemoptysis was not preceded or followed by pulmonary symptoms. He died in Hospital following an operation for cancer of the stomach, and at autopsy (274) obsolete tuberculosis of the lungs and bronchial lymph glands was found as the probable explanation of the bleeding. A second instance is that of a woman of 28, who entered in 1896 with the story of having had a hemorrhage two years before while stepping off a car. She began to cough only four weeks before admission and died from a recurrence of the bleeding. At autopsy (XI-204) the lungs showed tuberculosis with cavity formation. A third example is that of a man of 53, who entered in 1915, and stated that twenty years before, for a time, at intervals of every few months, he coughed up a mouthful of blood. Cough did not precede the hemoptysis, but slight hacking cough followed for a few weeks only. There were no subsequent symptoms referable to the lung, and he died in Hospital from perforation of a gastric ulcer. At autopsy (3530) obsolete tuberculosis of the lungs was found.

The single exception to the tuberculous origin of hemoptysis in this group illustrates an uncommon cause. This was the case of a man of

37, who entered the Hospital in 1904 with a history of winter cough without expectoration for three years. He had an abundant hemoptysis three days before entrance, and death occurred two days after admission from a recurrence of the hemorrhage. At autopsy (1196) syphilitic ulceration of the trachea and bronchi, with rupture of a large branch of the pulmonary artery into the right primary bronchus, was found.

Although other causes in rare instances are found in this group, none have come under my personal observation. Authentic examples of hemoptysis from the ulceration and rupture of anthracotic or tuberculous glands into the air passages, echinococcus disease of the lung, new growth of the bronchi and infection with *Distoma Ringeri* (endemic hemoptysis), may be found in the literature.

To judge from these cases it may be stated as a clinical rule, subject only to rare exception, that hemoptysis out of a clear sky or when cough and scanty expectoration alone cloud it is due to pulmonary tuberculosis. The rule seems to hold as well in those cases in which the hemoptysis occurs during a mild acute respiratory infection, after exertion, moderate injury or without any apparent cause. Exertion of itself cannot be regarded as an adequate cause of hemoptysis, but it may lead to bleeding earlier than would otherwise occur in a patient with tuberculosis owing to the added strain on the walls of blood-vessels already weakened by disease. Initial hemoptysis, even though the only symptom, without subsequent manifestations of pulmonary disease and the maintenance of full health until life is terminated by some other cause, is to be regarded as of probably tuberculous origin. Unless care is exercised in taking the history that all symptoms are included and it is established that the hemoptysis is an uncomplicated event, the situation may be wrongly interpreted. Hemoptysis from pulmonary embolism arising in consequence of latent venous thrombosis, for example, is likely to be accompanied by such other symptoms as dyspnea and pain in the side which serve to suggest that the case belongs in the second group.

#### HEMOPTYSIS OUT OF A CLOUDY SKY.

Cases in which the hemoptysis is an initial and uncomplicated event, justifying their inclusion in the foregoing group, comprise but a small proportion of the series. Preceding or accompanying symptoms or signs of pulmonary or other disease are more commonly present, and in this group, which may be termed hemoptysis out of a cloudy sky, in contradistinction to the preceding, the causes multiply and all enumerated in the list which follows are included.

#### THE CAUSES OF HEMOPTYSIS.

Of the various causes in the probable order of frequency, pulmonary tuberculosis doubtless occupies first place in consideration of the high incidence of this disease and the occurrence of



hemoptysis in about 60 per cent. of all cases at some time in their course. It is represented among the 307 autopsy cases at the Massachusetts General Hospital by only 27 cases, owing to the usual exclusion of patients in the active stage of the disease from the wards of the hospital. Chronic passive congestion probably occupies second place, but heads the list of the autopsy series with 105 cases. Then follow lobar (not broncho-) pneumonia, with 100 cases, pulmonary infarction with 48 cases, non-tuberculous pulmonary suppuration with 14 cases, aortic aneurysm with 7 cases, new growths of the lung with 5 cases and ulceration of the trachea and bronchi due to syphilis in one case.

Copious bleeding is seldom seen apart from pulmonary tuberculosis, occasional instances of abscess and gangrene, ruptured aneurysm, and ulceration of the trachea and bronchi. Insignificant hemorrhage and prominence of other symptoms and signs are the usual complex in chronic passive congestion, lobar pneumonia, pulmonary infarction, abscess, gangrene and new growth. Other causes than those enumerated in the list are rare and not found among the autopsied series. They may be grouped for the sake of completeness under such headings as mechanical injuries, toxic agents, such as the fumes of irritating gases, constitutional diseases (hemophilia, leukemia, hemorrhagic purpura and scurvy, animal parasites (pulmonary distoma, hepatic distoma), echinococcus disease (filaria sanguinis, filaria lymphatica), leprosy, actinomycosis and aspergillosis.

Our records are of interest in a negative sense in their failure to confirm the still too prevalent belief that vicarious menstruation is an adequate cause of hemoptysis, no example of which is found in the autopsy series. This and other evidence indicate that it cannot properly be regarded as a cause apart from some pulmonary lesion which is tuberculous in the great majority of the cases. Hemoptysis in the course of disturbances of the nervous system, in patients with the so-called "arthritic diathesis" (Sir Andrew Clark's type) and in those with high blood pressure, is likely to find its true explanation in one of the above-mentioned groups.

#### INFLUENCE OF HEMOPTYSIS ON THE COURSE OF TUBERCULOSIS.

Finally, I should like to refer to the influence of hemoptysis on the course and termination of the tuberculous cases. For the most part the bleeding is intercurrent and without any appreciable influence upon the course of the underlying disease, but in certain cases the hemoptysis is a direct cause of the fatal termination, the patient dying in consequence of the loss of blood or as a result of suffocation. Hemoptysis was thus an immediate cause of death in five of this series. Of greater frequency and importance, however, is the unfavorable influence which hemoptysis may have on the spread of the tuberculous process in consequence of the aspiration

of infected blood into neighboring or remote parts of the lung. This unfortunate occurrence is very clearly suggested in certain instances under observation when patients with normal temperature have hemoptysis and then in the following twenty-four to thirty-six hours the temperature rises and remains elevated until death occurs in the course of the next weeks or months. In this series there are eight cases in which, from a study of the records, the hemoptysis thus seemed to be the determining factor in the fatal termination. The danger of the retention of infected blood and consequent spread of the tuberculous process is constantly to be borne in mind in the treatment of hemoptysis due to tuberculosis, and it seems highly undesirable to use morphia as a routine as is so generally the custom in these cases. If morphia diminishes the irritability of the respiratory tract and suppresses cough, it may actually do harm by leading to the retention and aspiration of infected material and further spread of the disease. It would seem best, therefore, not to use morphia except for such definite indications as an harassing and unproductive cough and extreme nervousness. It is not, I believe, good treatment for the hemoptysis itself.

#### COMMON SENSE AND CONSUMPTION.

BY JOHN B. HAWES, 20, M.D., BOSTON.

It has been with the greatest of hesitation that I have written this article. The present status of the early diagnosis of pulmonary tuberculosis by the medical profession as a whole, in this country, is so far from what it should be, and so many unnecessary tragedies are caused thereby, that I should consider it in the nature of a calamity, if any opinion that I expressed could in any way be considered as an argument against making the diagnosis of tuberculosis even in a doubtful case.

The superintendents of the four state sanatoria in Massachusetts, whose advice I asked as to whether or not it was wise to consider the question taken up in this paper, felt very much as I did in regard to it. Their opinions are of interest. One of them says:

"I think we can afford to err on the side of over caution for a while longer in giving advice. To my mind, the most important point to impress on diagnosticians, is the importance of several examinations when possible. Before making a diagnosis in a doubtful case, the general practitioner should be impressed with the importance of symptoms in making his diagnosis, when he is not able to make it by physical signs alone."

Another one writes:

"I do not feel that we are admitting any



patients to this sanatorium who ought not to be here. Of course, we always have a few patients in whom, to our mind, the diagnosis is doubtful. We also have a certain per cent. of afebrile, repeatedly negative cases. Although the diagnosis may be doubtful in a few of these cases, I have always felt they should receive sanatorium treatment for a certain length of time. We have seen this class make rapid improvement following a residence of a few months in the sanatorium, so that they have returned to very active lives."

A third one writes:

"I think that many more physicians are able to make accurate examinations, and to consider carefully the presence or absence of tuberculosis in their patients, than was the case four years ago. Instead of hesitating about telling their patients that they have symptoms of tuberculosis, they are more afraid of not being the first to make the diagnosis. If in doubt they do not delay long before calling a consultant. . . . The physicians, however, need to have brought home to them the difference between infection and disease. . . . Furthermore, physicians in clinics somehow fail to remember that an apparently arrested case may have marked physical signs and always will have, although the individual may have established an equilibrium so well balanced between resistance and disease, that he can enjoy fair health and earn a living. . . . Doctors would make fewer errors in diagnosis if they depended more on symptoms, and placed less reliance on the physical signs that may be present. Physical signs without symptoms can usually be ignored. Symptoms, however, with or without physical signs, need careful study. The cause must be found and suitable treatment instituted as early as possible."

Despite this feeling on the part of these men, however, I believe that it is time for us to stop and consider exactly what we mean by the term "consumption," and exactly what it involves, as far as the patient is concerned, when we tell him that he is suffering from pulmonary tuberculosis.

Four years ago I wrote a paper entitled, "Is the Early Diagnosis of Pulmonary Tuberculosis Being Carried Too Far?" At that time I was struck by what I considered the hyper-conservative attitude taken by many physicians in diagnosing tuberculosis. The reasons for this attitude on their part, as they appeared to me at that time, were somewhat as follows:

"Many wrong diagnoses were being made, and as a result, many non-tuberculous patients were sent to sanatoria and health resorts."

"Such patients in whom wrong diagnoses were made and who were sent to a sanatorium, ran a grave risk of catching tuberculosis."

"Furthermore, it was a great injustice and source of hardship and injury to place on any

one who does not deserve what was called the 'stigma of tuberculosis.'"

A few held the view that a diagnosis of tuberculosis is rarely justified unless bacilli are present in the sputum.

"It is not right to 'break up the family' and send away the breadwinner, etc., unless the evidence is positive, and by the term 'positive' is meant 'positive sputum.'"

My own replies to these statements which I made in 1912, differ in certain respects so markedly from the replies which I would make at the present time, as to deserve further comment. To the first statement, that many wrong diagnoses were being made, I gave as my reply at that time that very few wrong diagnoses were made. I gave as evidence the fact that the number of cases at our state sanatoria which were classified as non-tuberculous in that year, amounted to exactly 4%. At the present time, not only is this percentage of cases in our state sanatoria definitely classed as non-tuberculous somewhat larger than it was then, but also our superintendents are coming to feel that it is not purely a question as to whether the patient is free from tuberculous infection, for this in adults would be excessively rare, but as to whether or not he is free from a *tuberculous disease which needs sanatorium treatment*. Looking at the question in this way, my answer would be that there are many wrong diagnoses being made, and that there are many patients in our state sanatoria and elsewhere, who are classified as consumptives, who are undoubtedly tuberculous but are not suffering from consumption needing prolonged sanatorium treatment.

My answer to the second question as to the danger of catching tuberculosis at any institution, is naturally the same now as it was in 1912; namely, that there is no such danger.

To the third question, concerning the amount of injury and injustice done to the patient, by calling him a consumptive on insufficient evidence, my reply in 1912 was that I considered the "stigma of tuberculosis" more a term than a reality, and that no harm, either physical or social, would result to a patient sent to a sanatorium because of a wrong diagnosis. This I would change. My feeling in regard to this matter at the present time is different from what it was four years ago. I believe that the word tuberculosis as a result of our active campaign against the disease, does carry a definite stigma, although perhaps more in the mind of the patient than in those around him. I feel very strongly that the physician who makes a positive diagnosis of tuberculosis bears a very grave responsibility, and that such diagnoses should not be made unless based on good evidence and for excellent reasons.

To the last two statements, in regard to making a diagnosis without a positive sputum, and the right or wrong in breaking up a family without a positive sputum, my answers would



be the same now as they were in 1912, so that no discussion regarding them is necessary.

There is a marked tendency at the present time toward the view that the infectiousness of tuberculosis among healthy, normal adults, is not so great as was supposed. While they do not in any way minimize the danger of the active, open case of consumption to children, they do feel that the intelligent consumptive is perhaps not such a source of danger to normal, healthy adults as was formerly supposed, unless the exposure is a prolonged and intimate one. This point of view is welcomed, I believe, by us all. It has been a great problem as to how long we ought to keep in a sanatorium or similar institution, the patient who is running a normal temperature and pulse, and who is healthy in every way except for certain signs in the lungs, and perhaps bacilli in his sputum. Up to the present, such patients have been urged to remain indefinitely on the ground that, as carriers of the disease, they should not be allowed to mingle with their fellow men, any more than a typhoid or a diphtheria carrier. It is more than probable that, except in rare cases such patients should continue to be kept as long as possible.

This question, then, as to what constitutes clinical consumption, needing treatment for a long time in a sanatorium, is one that should be discussed sanely and calmly. In regard to children, we have come to a fairly definite and satisfactory viewpoint. The time is now past when a child is stamped as a consumptive on the evidence of a positive tuberculin reaction, and a few vague and doubtful signs in the lungs. On the other hand, we no longer hesitate to call a child tuberculous and to institute aggressive treatment, when, in addition to a positive von Pirquet test, there are constitutional signs and symptoms, such as loss of weight and strength, ease of tire, fever, debility, etc., without adequate explanation, even if the signs in the lungs are slight or altogether absent. In other words, in the case of children, we have advanced to the point where we base our diagnoses on the study of the child as a whole, and not on the condition of his lungs alone. In adults, the situation is different and far from satisfactory. This is partly because of the tendency of the American public, medical and otherwise, in whatever it undertakes to swing from one extreme to another, and partly, chiefly perhaps, on account of the vigorous educational campaign that has been carried on during the past ten years. We are now reaching a point where it is dangerous for anyone to have a cough or a cold, or to lose weight, because some doctor is sure to shake his head gravely and say that he suspects tuberculous. Only yesterday, at one of our large Boston clinics, I saw a strong and vigorous young man who had come for treatment of indigestion with no symptoms pointing to his lungs. An eminently qualified physician had made a definite diagnosis of

incipient phthisis. The only evidence I could find to support this diagnosis was that years ago, in Russia, a doctor had told the patient that he had weak lungs and that on examination at the present time, there was slight dullness and prolonged expiration at the right apex. My own examination showed nothing abnormal, and yet this man had been definitely stamped as consumptive and referred to a social service department for investigation and disposal. In another similar case, I could find nothing in the patient's history pointing to tuberculosis, except that his wife was now a patient at Rutland. In the record of his physical examination there was "slight dullness at the right apex?" Confirming (?) this there was an x-ray plate "which shows an active process"! Neither I nor the majority of physicians would consider this sufficient evidence on which to make a definite diagnosis of active pulmonary tuberculosis needing sanatorium treatment, and yet an application had been filed for this patient's admission to a Massachusetts sanatorium.

It goes without saying that this subject must be approached with the greatest caution. Infinitely more harm is done and countless tragedies caused by lack of early diagnosis by the medical profession of today, than is done by making such diagnoses as above mentioned. We must not halt in our efforts to teach physicians and the public how to recognize this disease in its early and curable stages. We must continue our campaign of education and continue it vigorously, so that not only will patients go to the doctors in the early stages, but also doctors will recognize the disease and *be bold enough to say so*, and to institute the proper treatment at the time when it will do some good. In Massachusetts today—and I believe that our standards here are as high as, if not higher than, in any other state in the country in this regard—out of five hundred consumptives in our state sanatoria whom I investigated last summer, nearly *forty per cent.* were told by the first physician whom they consulted, that they did not have consumption, or, worse still, were not told so that they understood it that they *did have* consumption. With these facts staring us in the face, we must be extremely cautious in saying or doing anything that will tend to check the medical profession in its efforts to make early diagnoses of pulmonary tuberculosis.

But at least we can be sane on the subject. As Dr. John L. Morse says in regard to children, "Every child with a cough does not necessarily have consumption, nor does every case of snuffles mean syphilis." Likewise, in adults every protracted cold does not necessarily mean phthisis, nor does everyone who is tired out and who has lost weight and strength have consumption. In the lungs processes characterized by dullness and râles have existed, do exist, and will continue to exist that are caused by pneumonia, influenza and countless other organisms besides the tubercle bacillus. What, then,



should be our standards? What must we demand in the way of evidence before we say that this or that man or woman has clinical, pulmonary tuberculosis? How are we to distinguish between signs and symptoms due to tuberculous infection, and those due to tuberculous disease? In the absence of positive sputum, what evidence must we have before we say that a given area in the lungs, especially if at the base of the lung there are dullness, râles and altered breath sounds, is due to tuberculosis?

These are important and difficult questions to answer. At a recent informal conference of physicians interested in this subject at the Massachusetts General Hospital, Dr. Richard Cabot asked me to state my position in the matter, and to give the evidence I required before making a definite diagnosis of pulmonary tuberculosis in cases without a positive sputum. I told him that I could not give any definite set of requirements, but that each case must be judged on its individual merits. Nevertheless, there are certain general rules which I personally try to follow out. These I would state more or less categorically as follows:

Do not make up your mind beforehand that the case is, or is not, one of tuberculosis.

Do not hurry. In cases where the sputum is lacking or negative, two or three examinations of the patient and many of the sputum are often necessary.

In some cases I am willing to make a positive diagnosis on the history and constitutional signs and symptoms alone, *without signs in the lungs*. Such cases are not uncommon. Likewise, and rather less often, one can safely make a positive diagnosis on lung signs alone without marked constitutional disturbances.

In the vast majority of cases, I demand that there be present both signs in the lungs, generally including râles at one time or another, and constitutional signs such as fever, rapid pulse, subnormal temperature, loss of weight and strength.

Processes at the apices I consider tuberculous until I have proved the contrary; processes at the bases I consider non-tuberculous until the contrary is proved.

A hemorrhage—I do not include as such, minute streaks or flecks of blood in the sputum—in my mind always means tuberculosis until the contrary is proved. This rarely happens. It need not always mean, however, that the patient should give up his work for a long time and go to a sanatorium.

The x-ray gives *confirmatory* evidence which is rarely of great value in diagnosis when taken by itself.

The tuberculin tests I use only very rarely *in adults*. They are of little value and may do harm.

Observations of temperature and pulse, taken at home three or four times daily for three or four days, give evidence of the greatest value.

The most important evidence, and probably

most neglected, is that obtained from a careful and detailed study of the patient, his family history, habits, surroundings and occupation.

To sum up then, the diagnosis of early pulmonary tuberculosis or clinical consumption requires patience, perseverance, boldness, and above all, *common sense*.

The physician must remember always that he is dealing with a *human being*, and not merely a set of lungs normal or abnormal.

While the diagnosis may justly be made on signs in the lungs alone, or on constitutional signs alone, in the vast majority of cases there is a combination of both.

It is usually the careful study of the patient's history, his habits, surroundings, occupation, and the constitutional signs and symptoms that he presents, which is of paramount importance and which is most often neglected.

Do not forget that, in doubtful cases, it is possible and often wise, to institute proper treatment and to obtain the patient's fullest cooperation by a few minutes' plain talk, without definitely stamping him as a consumptive.

But above all things, remember that, from the patient's point of view, it is better to be "safe than sorry," better to undergo a few weeks or months perhaps unnecessary treatment as a "lunger" (and to gain physically by so doing), than to linger along in false security until the chances of cure are gone.



## SPRAINS AND SPRAIN-FRACTURE OF THE WRIST JOINT.

BY A. C. BURNHAM, M.D., NEW YORK.

THE frequent use of the x-ray during recent years has caused a considerable modification in the diagnosis and treatment of injuries about the joints, but it requires only a short experience in any surgical clinic to demonstrate the frequent errors of omission and commission which are associated with the diagnosis of so simple an injury as sprained wrist.

In the discussion of the injuries with which a sprain of the wrist joint may be confused, there are three general classes of injury which must be differentiated and which may be included under the general terms of sprain and fracture. Even this classification requires further definition, as the terms "sprain" and "sprain-fracture" have been loosely used and are often classed together under the general term of "sprains."

The term "sprain" should be limited to the partial or complete rupture of the ligaments about a joint without luxation of the bones. Should subluxation occur during, and as a part of the mechanism causing a sprain, the condition is essentially a sprain and should be considered as such. The tearing of the ligaments



may take place at any part of the ligament and may be so mild as to cause only a partial rupture of the fibres; or it may be severe enough to cause a complete division of the injured ligament.

If the fibrous band is so firm, however, that a portion of the bony attachment is torn away before the ligament ruptures, the injury is said to be sprain-fracture, and this term has been enlarged to include the tearing away of a portion of bone at the insertion of a tendon by a force which is exerted in such a manner as to tend to tear away the tendon from its bony attachment. The condition of sprain-fracture is, strictly speaking, a fracture, and while it may be conveniently described as a sprain-fracture, it represents pathologically a fracture and is related to a sprain only from a clinical point of view, because of the great difficulty of differential diagnosis.

The ordinary type of fracture is of interest in this connection because, in the region of the wrist, gross fracture is so frequently overlooked. This is more especially true about the wrist joint than it is about other joints,\* and because of its special surgical significance must be discussed in detail.

\*Omitting from the discussion the cases of Colles' fracture with marked deformity which reach the surgeon after several weeks or months of treatment as "sprain," there still remain a considerable number of cases in which the x-rays show a distinct fracture, and which lack most of the classical text-book symptoms upon which the student is supposed to base his diagnosis of fracture.

Ross and Wilbert, in 1902, called attention to the frequency of fractures in "so-called sprains" in various joints, and more recently Ross and Stewart (1912) have made an exhaustive experimental study of sprain-fracture and have demonstrated that many, if not all, luxations and subluxations are associated with sprain-fractures or gross fracture. Stern has collected a number of cases of joint injury treated for a considerable period as sprain, in which subsequent examination clearly demonstrated that the original injury had been a fracture. It has been claimed that ninety per cent. of the "sprains" that are referred to the radiographer show fracture.

The writer has limited this paper to the discussion of injuries about the wrist joint, because it is exactly in this joint that most of the injuries occur, and, consequently, in which careful examination will cause most of the errors of diagnosis to be brought to light. The bony prominences about the wrist are freely palpable, and, as x-ray examination is comparatively simple, it lends itself more easily to examination and study than any of the other large joints.

Given then a "sprain" of the wrist, in which the classical symptoms of gross fracture (crepitus, false point of motion and bony deformity)

are slight or absent, how are we to differentiate the various types of injury to which the so-called "sprain" may be due? True sprain is associated with the history of an injury which is followed, after an interval varying from a few minutes to several hours, by swelling and pain. The region of the joint is usually tender, but there is special localized tenderness over the ligament injured, and this may be greater or less, according to the extent of the injury. The motions of the joint which put this ligament on the stretch are very painful and the joint may be swollen, due to the accompanying effusion into it. The relation of the location of the trauma, as given in the history, and the point of maximum tenderness, as found by examination, is most important. A fall on the palm cannot possibly cause an injury to the dorsal ligaments of the joint, and the occurrence of acute tenderness on the dorsum of the wrist after such a fall should arouse suspicion of some other injury. In the same manner a fall on the dorsum of the hand, which may cause a sprained wrist, should not be the cause of tenderness along the palmar aspect of the wrist.

In many of these cases the point of maximum tenderness is at or near the attachment of the ligament, and in such patients there may be a sprain-fracture. From cadaver experiments, Ross and Stewart decided that the ligaments were often stronger than the bone at the points of their attachment. In some cases the small detached portion of bone may be felt beneath the finger.

Gross fracture, as has been stated before, is frequently mistaken for sprain. Its detection is usually simple and the diagnosis may be made with the expenditure of a little time and with very slight discomfort to the patient. In the type of fracture commonly confused with sprain, swelling is practically always present, while deformity is absent, or is so slight that its detection is difficult or impossible. Ecchymosis is present, but usually late in making its appearance. Tenderness by direct and indirect pressure is always present, and is most important for purposes of diagnosis. Crepitus and false point of motion are absent or obtained with difficulty. When present they are elicited only by unjustifiably painful manipulations. Measurements usually give no information, the bony prominences retaining their normal relations. Function is usually limited, but in a few cases there is a surprising preservation of the normal movement of the wrist even in a fracture with considerable displacement.

We have, then, the same symptoms associated with the non-deforming fractures about the wrist joint as are found in sprained wrist, and it is this similarity which causes the confusion of these two conditions. This confusion is for the most part absolutely unnecessary, even in the absence of radiographic examinations.

The symptoms of sprain are pain, loss of function, swelling, tenderness and ecchymosis.



The symptoms of fracture near the joint are exactly the same, and it is only by the most painstaking examination that the two conditions may be differentiated. The differential diagnosis is based almost entirely on the character and location of the local tenderness. In sprain the tenderness is most acute over the torn ligament, and if a satisfactory history is obtainable it will be noted that the tenderness is located over some part of the ligament which was stretched by the force of the trauma. By the indirect method, tenderness is elicited by the motion of the joint which makes the torn membrane tense. This should correspond with the movement described by the hand in the causation of the sprain. Thus forcible dorsal flexion may cause a laceration of the anterior ligaments of the wrist joint (sprained wrist), and in such a case there should be direct tenderness over the anterior ligaments, and hyperextension (dorsal flexion) should cause pain referred to the anterior aspect of the wrist joint.

The same symptom (tenderness) is present in fractures near the joint, but its character and location are so distinctive as to make possible a diagnosis almost beyond question. The pain of fracture has been described by Skillern as "wincing" and by Stern as "pencil tenderness." Both names are descriptive of the type of tenderness found. If the injured bone is palpated with the finger end, or better, with the rubber end of an ordinary lead pencil, a peculiarly acute type of tenderness is elicited at the point of fracture, which almost always causes the patient to wince perceptibly. If the bone is palpated wherever its surfaces are superficial, this area of "wincing" tenderness may be mapped out and will almost always correspond definitely with the line of fracture, failing only in those cases in which there has been a trauma of the bone, due to direct violence. The duration of local tenderness in fracture is usually three or four weeks or longer, in contradistinction to sprains, in which the tenderness usually lasts only a few days to one or two weeks. The location of the "wincing" tenderness in fracture is important. Evidently it must occur not over the joint, but over the bone at the point of fracture and, characteristically, it occurs some distance from the point of trauma, in a location where tenderness would not be present in the absence of fracture.

The search for local tenderness in injuries about the wrist joint is extremely important and cannot be too greatly emphasized. Once the examiner is trained to search for this type of tenderness, the diagnosis of obscure injuries about the wrist (and other joints) becomes comparatively easy, and the number of cases of "sprained wrist" shows a corresponding decrease. If we suppose, as above, that forcible dorsal flexion has caused an injury to the wrist and a line of wincing tenderness is found about one-half inch above the wrist, there being, at the same time, only slight or moderate tenderness

over the ligaments, it is evident that the lesion is not a sprain but an injury to some structure above the wrist joint. Thanks to the x-rays, we now know that these cases practically all represent linear fractures, with little or no deformity.

Radiographic examination is important in these cases, but care should be taken to interpret the plates correctly. In the presence of symptoms as described above, the fracture is usually easily detected, but there is a considerable number of cases in which the parts must be radiographed in several directions before the line of fracture can be made out. Cases occur in which repeated skiagrams fail to show fracture, but which show typical callus several weeks later. In order to emphasize the unreliability of the x-ray and the comparative importance of localized tenderness, I quote verbatim from Skillern, whose opinions I heartily endorse: "The diagnosis of an injury to the forearm should always be made by careful clinical investigation. It is a great mistake in more than one way to depend exclusively upon the skiagram. A skiagram must be considered merely as one of the many signs of fracture. There are two factors which will diagnose 90% of fractures of the forearm clinically. One is a thorough understanding of the mechanism obtained from a careful history, and the other, "wincing" tenderness. It has been shown that a given mechanism is apt to produce a certain fracture. This, in turn, indicates where to examine for "wincing" tenderness. When the site of fracture is reached, moderate pressure with a finger tip causes the patient to wince; he screws his face up and involuntarily withdraws his arm. This is almost pathognomonic of fracture."

It is impossible within the limits of this paper to do more than indicate the different varieties of fracture which are frequently confused with sprained wrist. Fractures of the lower end of the radius are the most frequent. Of these, Colles' fracture, with slight or no displacement, is probably most often seen. Longitudinal fracture of the lower end of the radius, oblique fracture (Barton's) of the lower and outer aspect of the same bone and T- and Y-shaped fractures are not uncommon. Fractures of the tip and lower end of the ulna are less common, and fractures of the scaphoid and semilunar bones are probably frequently seen but rarely diagnosed in the absence of the x-ray. Of especial interest in this connection are green-stick fracture and separation of the epiphysis in children. These conditions frequently are negative to x-ray examination and depend for their diagnoses entirely upon the history and localized tenderness. Luxation of the epiphysis without permanent displacement is frequently mistaken for sprained wrist. It is sometimes referred to as epiphyseal sprain. However, in most cases, epiphyseal separation consists of a combination of separation and



fracture of the adjacent bone. Infectious arthritis and synovitis may simulate sprained wrist, but the history and progress of the disease soon makes the diagnosis clear.

The treatment of sprained wrist depends somewhat upon the location of the injured ligament. When the dorsal or lateral ligaments are injured, a satisfactory dressing consists of strips of adhesive plaster crossing at the back of the hand and extending from the metacarpophalangeal joint to about the mid-forearm, being so applied as to limit flexion at the wrist. When the anterior ligaments are injured, which occurs only very rarely, rest and massage is the treatment of choice.

When the condition is such that the injury cannot be differentiated from fracture, it is better to consider the lesion as a fracture and to treat it accordingly. A plan which has been found satisfactory in the treatment of fractures of this type (fractures near joints without gross deformity) is fixation combined with early massage and passive motion. As such treatment is equally beneficial in sprained wrist it merits description in some detail. The wrist is fixed by means of a posterior splint extending from the knuckles to the upper third of the forearm and the patient told to return daily for massage and passive motion. The massage is begun on the second day with very gentle manipulations, the arm being stroked gently and superficially from the fingers toward the elbow, according to the method of Lucas-Championnière. Care should be taken to cause little or no pain, and to massage constantly in the same direction. As the pain diminishes, the fingers, and later the wrist joint, should be moved, at first passively and later actively, the amount of movement depending upon the subsidence of the pain and swelling. Usually ten to fifteen minutes' massage during the first day is sufficient, but the period may be lengthened to twenty-five or thirty minutes after a few days. Under this treatment there is a rapid subsidence of tenderness and swelling, if the case is sprain, but should fracture be present the improvement is more gradual and the tenderness persists even after several weeks.

In conclusion, attention should again be drawn to the importance of the early recognition of fractures near the wrist joint, and emphasis should be placed upon the fact that "sprained wrist" is a diagnosis which often serves as a cloak to hide the ignorance of the physician. The belief that "a bad sprain is worse than a break" is based upon the fact that a "bad sprain" is usually a fracture, and it is worse than a break because it is treated as a sprain and neglected as a fracture.

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## A STUDY OF PEPTIC ULCER FROM THE DIAGNOSTIC POINT OF VIEW.\*

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IN this paper I have grouped gastric and duodenal ulcer under one heading, that of peptic ulcer, since physiologically, clinically, and pathologically, the first part of the duodenum is identical with the stomach.

In browsing through the literature, which is voluminous, I was surprised at the alleged frequency of ulcer. Mumford has stated "that of all the lesions giving rise to digestive disorders, ulcer of the stomach and duodenum holds the first place."

W. H. Welch estimated that about 5% of mankind suffer from gastric ulcer, figures founded on findings at autopsy of open or cicatrized ulcers. Some writers place the percentage much lower, while others claim much greater frequency. Mumford believed that the true percentage was probably higher than Welch's estimate.

Careful analysis shows that gastric ulcer is as common in men as it is in women, though duodenal ulcer is perhaps more frequent in males.

The most frequent age given is twenty to forty years, but an analysis of a long series of cases shows that ulcer is more liable to occur between forty and fifty. Frequently ulcer patients are over fifty, but the records show few cases under twenty. Ulcer has been found in young children.

The conjugal condition, occupation and family history seem to play little part, but ulcer seems to be a trifle more frequent in the negro race; and if reports from Teuton sources are correct, the Germans seem more prone to ulcer than other nationalities.

In looking over the previous history of ulcer cases, in a few instances there is a definite history of trauma. It is generally conceded that burns may lead to ulcer, especially of the duodenum, but I could find no satisfactory explanation of the circumstance. There is no doubt that arteriosclerosis, by predisposing to thrombosis, plays some part in the pathogenesis of ulcer. Syphilis may have a place in the etiology through the production of a local specific endarteritis. Endocarditis may give rise to embolism and should be considered. One investigator found, in a series of ulcer cases,

\* Read at a meeting of the Faculty of the Medical School, Jan. 11, 1915.



valvular disease present in 9%. It is agreed that any chronic disease which lowers the vitality, such as tuberculosis, increases the liability to ulcer. Alcoholism may predispose. A certain percentage of cases give a previous history of chlorosis, and in a very large majority there is a definite history of "stomach trouble" persisting for months before the onset of symptoms suggesting ulcer. The majority describe it as "indigestion," as shown by discomfort after the ingestion of certain articles of food, eructations of gas and pyrosis. A study of peptic ulcer shows that the previous history of "stomach trouble" verges into the present illness without any line of demarcation. In other words, if we go back to the onset of dyspeptic symptoms, we shall know when the ulcer or ulcers started.

How do peptic ulcers form? This is a much debated question. W. J. Mayo seems to lean toward the theory of mechanical injury plus excessive acidity, while Leube says "A weak constitution, chlorosis, and anemia predispose to ulcer." Riegel states that local trophic changes take place, necrosis ensues and the dead tissue is naturally digested by the gastric juice. He believes that hyperchlorhydria (if present) is a manifestation of abnormal irritability on the part of the secretory glands of the stomach. His is the most reasonable hypothesis from my point of view.

The cardinal symptoms of ulcer are pain, vomiting and hematemesis. In Greenough's and Joslin's series of 187 cases, 96% had vomiting, 92.5% had pain and 79% had hematemesis. Pain is the predominant subjective symptom. In 50% of a series of 82 cases, pain was the chief complaint. In 47.7% "stomach trouble," dyspepsia, or vomiting were the symptoms for which relief was sought. In only 6% was the vomiting of blood voluntarily mentioned.

Only a few of the cases in this series could be termed acute, the large majority being examples of chronic ulcers existing from two months to twenty years. The usually accepted time limit, however, is from three to five years.

Pain is usually the first indication of the existence of ulcer, and is its most constant and distinctive feature, although, as we all know, pain is sometimes difficult to estimate. In ulcer cases it is usually epigastric, sometimes referred to the back, sometimes to the left shoulder blade, and rarely to either hypochondrium. In passing, it is a mistake to believe that the location of pain gives any clue to the site of the ulcer, for in 27 cases where the location of the ulcer was determined at operation or autopsy, the site of pain seemed to bear no relation to the location of the ulcer.

The pain is usually severe in character, though it may not exceed that of hyperchlorhydria; it is rarely continuous and, if so, usually denotes some complication such as localized peritonitis, adhesions or hyperchlorhydria. Pain is variously described as sharp, dull, aching, burn-

ing, colicky, gnawing or grinding, also as cutting or tearing. It is often influenced by position, usually increased by eating, but may be relieved or be entirely independent of food. Gerhardts makes the point that, while the patient would like to eat, he is often afraid to do so on account of the suffering which may ensue.

Vomiting is about as common a symptom as pain. In most cases it is frequent, in a few constant, and in others periodic. In a certain number of cases it is only occasional, following paroxysms of pain, or the ingestion of certain food. The quantity of vomitus varies, but is profuse only when there is pyloric obstruction or hypersecretion. Analysis of a series of 22 cases shows there is less liability to vomiting and pain when the ulcer involves the lesser curvature. In Howard's series pain was practically constant, except in ulcer of the pylorus or lesser curvature. Vomiting is also less frequent where ulcer is duodenal. Indeed it is stated by Moynihan that pain is the only symptom of duodenal ulcer. Ulcers involving the greater curvature or either orifice produce more constant vomiting.

Hematemesis occurred in 76% of 82 cases. Two-thirds of these had coffee ground vomitus, and one-third bright red. Of course the coffee ground vomiting occurs when the blood stays in the stomach long enough to be acted on by the gastric juice. Hematemesis often occurs more than once, and sometimes gives immediate relief to pain and vomiting.

Severe hemorrhage from an ulcer almost invariably gives bloody or tarry stools. This may not be accompanied by hematemesis when the ulcer is in the duodenum or near the pylorus. Patients are not reliable observers as to melena. The color of the blood varies according to the quantity, freshness and length of time taken to pass through the intestinal tract.

Nausea is noted in a relatively small percentage of cases, which seems natural, as vomiting is generally the result of pain, and is an attempt on the part of the stomach to get rid of irritating material. It does not usually require much effort.

There is almost invariably discomfort after eating, eructations, pyrosis, headache, palpitation and meteorism. This may be due to chronic gastritis, or attendant hyperchlorhydria.

Patients with ulcer are usually constipated, probably on account of the small amount of solids taken and retained. On the other hand, a small percentage of cases show looseness if not actual diarrhea.

There is almost invariably a loss of strength and some loss of weight, due to pain and inability to eat. Sometimes the loss of strength is due to hemorrhage. Marked loss of weight suggests cancer but it must not be forgotten that pain, coffee ground vomitus and marked loss of weight can all be present in benign ulcer of the stomach.

Tenderness is the least important of the physical signs. Its absence or presence is responsible for many errors in diagnosis. In a series



of 187 cases, it was noted in 69.5%, and the degree varied from one extreme to the other. It is usually located in the epigastrium, but may be in either hypochondrium, in the right iliac fossa, or the umbilical region.

Authorities seem to differ widely as regards demonstrable mass or resistance. In Osler's and McCrae's series, it was noted in three-fourths of the cases. In Howard's series in about one-third. Gerhardt says it may be found in any one of four conditions, namely, (1) Thickened base and hard margin of the ulcer itself; (2) functional hypertrophy of musculature; (3) localized exudate or abscess from perforation; (4) adhesions between neighboring organs.

It is estimated that the stomach is dilated in 20% of ulcer cases. Dilatation would signify pyloric obstruction; directly from the ulcer, resulting scars, or perigastric adhesions; or indirectly, from pyloric spasm.

The determination of free HCl is of value in the analysis of gastric contents, but too much importance should not be attached to it. In Howard's series, analysis of gastric contents, after a test meal, showed HCl diminished in 26%, practically normal in 27%, and increased in only 18%. It is valuable to note the contrasting results in a series of cancer cases where free HCl was absent in 92%. The relative infrequency of hyperchlorhydria in ulcer cases, as shown by analyses, is somewhat contrary to the generally accepted belief, but it fits in nicely with Riegel's explanation.

Röntgenologists are, of course, enthusiastic over the advantages of their method of diagnosis and claim the ability to diagnose a large percentage of ulcer cases. Doubtless, in many instances, regional x-ray photographs, after the ingestion of a bismuth soup, would show characteristic depressions in the gastric or duodenal mucosa as well as the cicatricial contraction which follows extensive ulcers.

There is but one other laboratory test of value and that is the finding of occult blood in the stools or in the gastric contents.

The alterations in the blood are those of secondary anemia due to hemorrhage.

The urine shows nothing of interest.

Fever is present in about one-third of the cases, but does not exceed one or one and one-half degrees. It is usually not continuous and, if irregular, signifies a complication.

Of 76 cases collected by Howard, 5 had definite pyloric obstruction and two had duodenal stenosis.

In Greenough's and Joslin's series, there were 7 fatalities from hemorrhage and in Howard's cases 7.

Perforation is rather rare, Howard noting 6 cases out of 82.

Parotitis is not a rare complication. I suppose it is due to lowered resistance to bacterial invasion.

There may be almost any associated condition.

As regards diagnosis, it is not easy. Sava-

reault estimates that 20% of ulcers do not produce symptoms. M. C. Millet believes that every other case is undiagnosed in life.

Osler says, "The condition may be met with, accidentally, post-mortem. In other cases again, for months and years the patient has had dyspepsia, and the ulcer may not have been suspected until the occurrence of sudden hemorrhage."

H. D. Niles, in a series of 75 cases, found that in 88% the initial symptoms might easily be attributed to any mild digestive disturbance. In his series the average time from the first symptom to operation was 8 years. He believes that if a stomach ailment is of long duration, or recurs without apparent cause, it is probably due to ulcer rather than to a functional disturbance.

Moynihan says that, "hyperchlorhydria is the medical term for the surgical condition called duodenal ulcer."

The recognition of duodenal ulcer is probably more difficult than that of gastric ulcer, for there is usually less symptomatology. The patient usually states that attacks of pain have recurred for years past; sometimes daily, perhaps only once a year. During intervals patients are usually perfectly well, although they sometimes complain of persistent acid dyspepsia, or burning distress some hours after meals, often at night. Relief is obtained by taking food, or some simple antacid, like soda bicarbonate. With duodenal ulcer there is seldom any vomiting, and the physical signs are usually negative. There may be tenderness during the attack or immediately after.

In gastric ulcer troublesome dyspepsia is more likely to be persistent between attacks. The pain is usually of the same character, but is more liable immediately to follow eating. Following a test meal the stomach contents may show occult blood. In duodenal ulcer occult blood might be found in the feces, but seldom in the stomach contents. There is usually more tenderness in gastric ulcer.

In general it is very difficult to differentiate between ulcer of the duodenum and ulcer of the stomach, and it is hardly necessary. It is far more important that we recognize or differentiate between a functional disturbance of the stomach, such as acid dyspepsia and ulcer, no matter whether gastric or duodenal.

There is no single symptom or laboratory test upon which we can rely. We must depend largely on groups of symptoms, and, where after careful study the diagnosis is doubtful, resort to exploratory laparotomy.

Where the diagnosis rests between ulcer and cancer, we must remember that practically all cancer cases show absence of free HCl, accompanied by loss of appetite, and rapid emaciation, symptoms most unusual in ulcer. Differentiation is not ordinarily difficult.

It is more difficult to rule out attacks of hepatic colic. There are the same recurring seizures, possibly the same chronic dyspepsia, and in the



interval the patient is perfectly well. However, the pain is different in character, being colicky, with remissions and exacerbations coming on more suddenly and ceasing more abruptly than in ulcer. It usually starts in the epigastrium but radiates quickly to the right costal border, and around into the back underneath the right shoulder blade. The pain is not relieved by food, alkalies or vomiting. Patients with biliary colic often feel chilly, sweat profusely, are almost invariably nauseated, and vomit frequently.

In about half the cases, jaundice follows the attack. The tenderness and rigidity following the attack is at the right costal border. Occult blood does not occur in the feces unless complicated by some other condition.

If we bear in mind the frequency of peptic ulcer, and are diligent in the study of our chronic "dyspepsia" cases, we may be spared humiliation and remorse. Undoubtedly in many instances ulcer is the true diagnosis.

## THE FIRST CASE IN WHICH ABDOMINAL SURGERY WAS SUGGESTED FOR THE RELIEF OF EPILEPSY.

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WITH NOTES ON THE OPERATION.

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ON August 7, 1913, there was published in this JOURNAL an article entitled *The Role of Gastric and Intestinal Stasis in Some Cases of Epilepsy*. This was a report of what was probably the earliest employment of the bismuth x-ray in the study of epilepsy, and in conclusion the writer stated that he felt reinforced in his belief that in so-called idiopathic epilepsy the essential lesion was not in the nervous system. All assertions made in that article have since then been verified by others. In one of the cases, after consultation with Dr. Frank H. Lahey, it was decided to advise the patient to submit to an abdominal operation, not for the cure of constipation, but for the relief of the epilepsy. Sufficient time having elapsed, we now feel that the case may be reported.

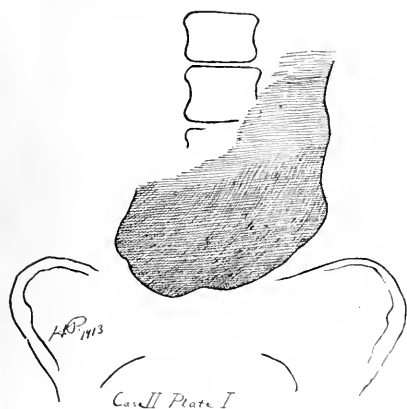
The following description of the case and the illustrations are from the original article:

had epilepsy. His father's grandparents were first cousins. He is a brunette like his father's family. At fifteen he had measles and shortly afterward his first epileptic seizure. The attacks have occurred about once in two or three weeks since then. They are preceded by tremor of the facial muscles, sometimes twenty-four hours beforehand. They are of grand mal type, lasting a few minutes and followed by stupor for a half hour and drowsiness for the remainder of the day. Examination was negative except for a fine tremor of the outstretched fingers. Salt-free diet and sodii bromidi gr. x t.i.d. were prescribed. Later, because of a bromide rash, Bromotone gr. v t.i.d. was prescribed. Under such treatment there was no change in the severity or frequency of the attacks. On Oct. 9, 1912, when first seen by the writer, he reported that while in New Hampshire during the summer he had been very much worse. He was then instructed in abdominal exercises and advised to use laxatives more frequently. On Jan. 27, 1913, he reported only one attack since the last visit in October, and that was on Christmas Day after dinner. On Jan. 28, 1913, the first radiograph was taken. Plate I shows the stomach much dilated and extending down into the pelvis. Plate II, after five and one-half hours, however, shows the stomach quite empty and the bismuth meal occupying part of the ileum and the colon as far as the splenic flexure. The transverse colon is far below the iliac crests and the hepatic and splenic flexures are thereby much accentuated. Plate V, after forty-eight hours, shows the transverse colon still occupied by the bismuth meal, which would be normal after twenty-eight hours. There is none in the caecum or hepatic flexure and this points to the very low transverse colon as the cause of the stasis. Plate VI, after fifty-four and one-half hours, shows the descending colon and rectum still full, which would be normal after thirty-two hours. *In this case the possibility of relief through surgery suggests itself and this will be attempted with the patient's consent.*

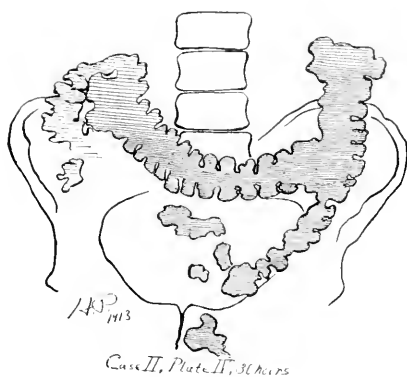
The patient at that time was a typical epileptic as described in the text-books: heavy in body and mind, unfit for any employment and discouraged. After eight years of treatment by the various bromides and by the salt-free diet, the milk and vegetable diet, *et cetera*, he had not enough confidence left in medicine to begin another course of treatment, and, after the radiographs were taken, he did not return to the hospital until September, 1914. He was then willing to submit to an operation, and on Sept. 17, 1914, a colectomy was performed by Dr. Lahey. After his recovery from the operation, he was unwilling to be placed upon a régime, but ate everything that he cared for and, after his old habit, he bolted and gormandized. Notwithstanding this, he remained free from attacks until Dec. 14, 1914. In March, 1915, he had another attack. He was then willing to submit to treatment and was placed upon a diet list published by the writer in the *Interstate Medical Journal* for December, 1914, and for some time in use in the Boston City Hospital. This diet is not vegetarian or salt-free and in it the abuse of milk is avoided. It may be briefly described as one excluding fried food, fresh white bread, pastry, beans, milk, except in moderate quantities only with meals, and uncooked fruit except oranges, figs and dates. The diet list bears a footnote directing the patient to chew thoroughly, eat slowly, never hurry after eating, never to eat too much and not to eat

"CASE 2. Male, age 23, occupation clerk. First entered clinic Feb. 15, 1911. Two paternal uncles

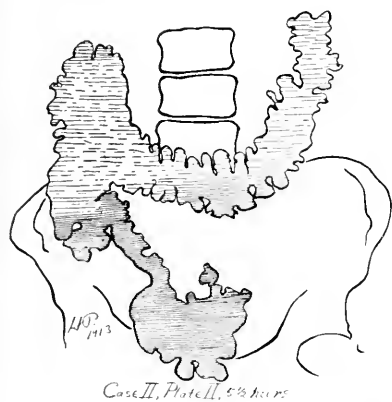




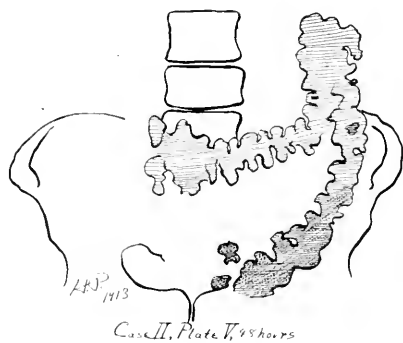
Case II, Plate I



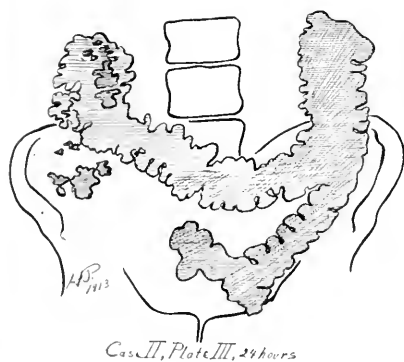
Case II, Plate II, 30 hours



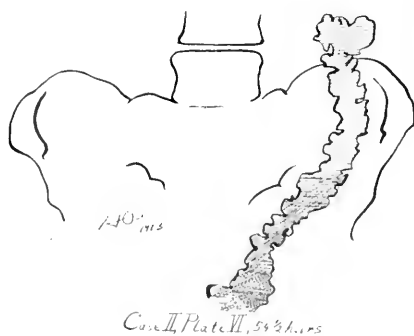
Case II, Plate III, 5 1/2 hours



Case II, Plate IV, 48 hours



Case II, Plate V, 29 hours



Case II, Plate VI, 54 3/4 hours



for pleasure. It is based upon the facts that nearly all epileptics are bolters, nearly all are constipated and nearly all eat too much, especially of the prohibited articles. Its rationale was discussed in the article in which it was first published.\* The patient, on resuming treatment, was first given:

R Sodii bromidi 5iiss  
fl. ext. cascara 5v  
aq. ad 5iv  
Sig. 5i t.i.d.

R Thymol gr. iv before meals.

R Sodium bicarbonate gr. x when having flatulence or abdominal pain.

The bromide was discontinued June 13, 1915, and the sodium bicarbonate and cascara were discontinued in July, 1915. He has had no medicine for epilepsy since then. He has remained more than a year without an attack and without vertigo or any so-called epileptic equivalent. During that time he has been in business and he is more keen and energetic than the average individual. Moreover, his work is indoors and he has not been compelled "to find some active out-of-door pursuit." No discomfort has resulted from the operation except that he has two unformed movements daily.

We do not conclude that colectomy should be done in every case of epilepsy or in every severe case. While the colectomy undoubtedly assisted in the treatment of this case, perhaps the patient would have been relieved without the operation, had he been willing to submit to the régime upon which he was finally placed. This régime without the operation has produced equally good results in other cases. No case should be submitted to colectomy merely because it has failed to improve under bromides and a vegetarian diet. When constipation is manifest and gives way to non-surgical treatment the writer does not consider it essential to have serial radiographs made and prefers not to do so, for the reason that this procedure makes it necessary to suspend treatment for two days, sometimes causing a series of attacks. The x-ray should be used when no history of constipation can be obtained and when surgery is contemplated. Two years ago, with the cooperation of Dr. Ralph D. Leonard, radiologist, the writer undertook to determine whether or not incompetency of the ileocecal valve were a factor in epilepsy, thinking that regurgitation into the ileum might induce the attacks. But in several cases the valve was found to be competent and distention of the caecum and colon by the high bismuth enema was followed by attacks. Therefore this work was not continued. In another of our cases in which colectomy was done, the patient became maniacal a few hours after the operation and forty-eight hours thereafter died of exhaustion. Operation in this case was resorted to because the patient would never continue

treatment faithfully, was growing worse and was subject to attacks of automatism in which he endangered himself and others. Not infrequently do epileptics present symptoms of chronic appendicitis, with or without colitis, and these cases the writer believes should be submitted to whatever operation is indicated, as the first step in their treatment.

In conclusion I would urge conservatism in the employment of colectomy in epilepsy because, in my own experience, equally good results have been obtained without it, when the full coöperation of the patient and his family have been obtained; and because the too frequent resort to colectomy would eventually bring this useful measure into disrepute. It should be reserved for cases in which rational non-operative treatment, with painstaking attention to detail, directed toward the relief of the intestinal condition, has failed, and for cases in which, because of mental enfeeblement, or for other reasons, the coöperation of the patient in his treatment can not be secured.

#### NOTES ON THE OPERATION, BY DR. LAHEY.

It is the writer's wish to endorse what has been said by Dr. Powers in relation to conservatism in the employment of colectomy in epileptics. Regarding its curative value, only time and a number of cases can tell.

The operation itself is not an extremely difficult one, nor is it extremely dangerous. Its immediate danger arises from shock (of this there has been none in cases done by the writer) and the danger of leakage which always goes with an intestinal anastomosis. In the case cited in this paper the convalescence from the operation was even easier than from an interval appendectomy. About eight inches of the ileum, all of the caecum, ascending, transverse and descending colon were removed and the ileum anastomosed into the rectum. The caecum was extremely large and its walls considerably thinned.

As to advising the operation in epileptics, my position has been to tell the patients and their relatives frankly that there is a definite danger in the operation (although I believe it is but slight with careful technic) and that I can do the operation only if they understand that it is a last resort, and that too few cases have been done to do more than undertake it as a possible measure of relief and by no means an assured one.

In the few cases seen by me, the operation has not been considered by the patients or suggested by Dr. Powers unless they were in such condition that they were a burden to themselves and friends. In such cases it is my opinion that it is justifiable to submit them to the operation of colectomy, unproven as it is.

\*Powers: "Some Observations on Diet in Epilepsy," Interstate Medical Journal, St. Louis, December, 1914



## PROLAPSUS ANI IN ADULTS.

BY T. CHITTENDEN HILL, M.D., BOSTON.

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THERE are two varieties of prolapse of the rectum that can be recognized by one familiar with these conditions. As the treatment of each differs essentially, a few words about them both will not be out of place here. The first variety is prolapsus ani or prolapsus mucosae recti. A protrusion of two inches is about the extreme amount found in this condition, and is, therefore, a point of importance in determining with which variety one is dealing. The protrusion of the mucous membrane not infrequently is limited to one side, but as a rule, both sides are protruded.

The other form of prolapse is a protrusion in which all of the coats of the bowel, including mucous, sub-mucous, muscular and, in certain aggravated cases, even the peritoneal investments, are prolapsed. This latter state is more commonly referred to as procidentia recti. It may, perhaps, be best described as a turning inside out of the lower portion of the bowel. Thus we see that it is very desirable that these two distinct varieties, which are often loosely classified together, should be clearly borne in mind, as the treatment of each is decidedly different.

In this paper I wish to confine myself to a discussion of prolapsus ani and describe a simple operation which effects a permanent cure. There are two principal reasons for calling attention to this subject.

1. Practically all cases of procidentia are the result of neglect or improper treatment of what was in the beginning a simple form of mucous membrane prolapse. The mucosa is attached to the muscular wall of the rectum by a loose network of connective tissue, which normally permits a certain degree of mobility of one coat upon the other. If this mobility becomes exaggerated, whether from a general laxity of the tissues, loss of tone of the sphincters or the absence of fat in the ischio-rectal fossa, an eversion of mucous membrane takes place. If surgical intervention is not instituted at this stage the next step may be a slipping out of the rectum in its entirety. Therefore early prophylaxis should always be insisted on.

2. Prolapsus ani occurs at all ages. It is especially common in young children, but they seldom require operative treatment. It is frequently seen in middle life, and among elderly people it is often their chief infirmity. I believe it is a great mistake to advise any of these patients, even the decrepit and aged, to be satisfied with palliative treatment, which never, at

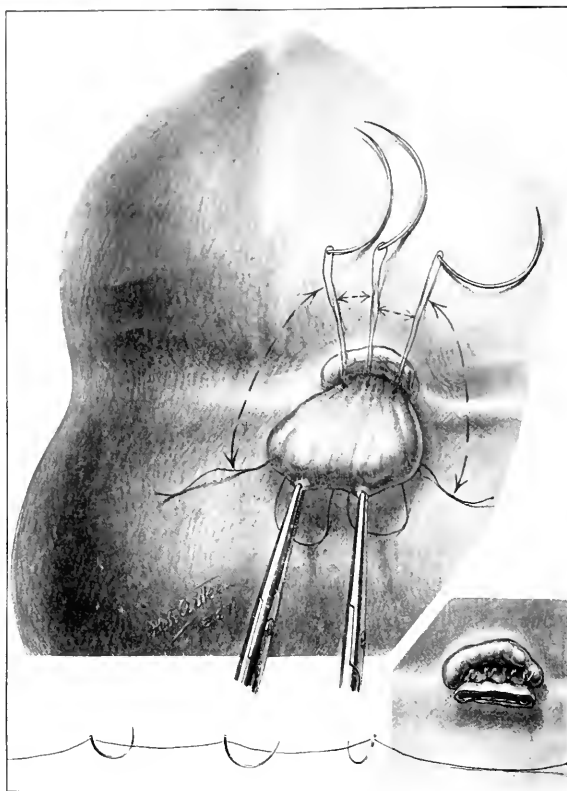
the best, affords much relief, when a safe operation can be easily performed under local anesthesia. Several of my patients have been over eighty years of age and would have been considered poor surgical risks had general anesthesia been required, but, without exception, they made quite as rapid recoveries as do much younger subjects. The importance of relieving the easily remedied defects of old age cannot be overestimated. Many of these neglected cases of rectal prolapse become practically confined to the bed or at least must assume the recumbent position the greater part of the time on account of the protrusion, which recurs when standing or walking about. Such inactivity is a severe tax upon their vitality, and will inevitably lead to an increase in the normal mortality of advanced life.

Various procedures have been recommended and are used in the treatment of this condition. Caulterization by applications of nitric acid or by linear burning with paequin is unreliable and, therefore, should not be employed. The removal of elliptical strips of the redundant mucous membrane with the clamp and cautery will often give satisfactory results, but it does not remove all the pathology. There are technical difficulties, as the clamp is a clumsy instrument to use without thorough division of the sphincters, a procedure distinctly harmful in this class of cases. Moreover, the realization that a red hot iron is being used distresses nervous patients unless done under full surgical anesthesia. Whitehead's operation is essentially a circular excision of the prolapse followed by suturing the mucous membrane to the skin at the anal margin. My objections to this method are the loss of blood attending it, the length of time consumed and the slow and irregular healing which often ensues.

The following operation I have found best adapted for cases of prolapsus ani. The main features of this method<sup>1</sup> were first advocated and practised by the late Mr. Goodsall, at St. Mark's Hospital for Diseases of the Rectum, London, Eng. With certain modifications, I have now employed it with entire satisfaction for twelve years. Mr. Goodsall did not incise the mucous membrane at the muco-cutaneous junction, nor did he excise the prolapse. He applied the ligatures in the ingenious manner I shall presently describe, after which he recommended that "As soon as all the ligatures have been tied, the strangulated parts should be returned into the rectum and kept in position by a plug of cotton wool soaked in twenty per centum solution of cocaine." On the other hand, my practice has always been first to separate the mucous membrane from the skin with a shallow incision, which renders the operation less painful. Then, after the ligatures have been tied, I cut away the fold of mucous membrane so that it is quite unnecessary to plug the rectum.

<sup>1</sup> Goodsall and Miles: Diseases of the Anus and Rectum. Part II, page 11.





Illustrates how needles are passed through fold of mucous membrane, and dotted lines with arrow-points indicate the loops to be tied together. Three needles threaded on linen suture, three feet long. Small illustration shows suture tied and prolapse retracted.

The patient should be in the right lateral semi-prone position, with an assistant to support the left buttock, or in the lithotomy position. Personally, I have accustomed myself to operate with patients in the former position, and I think it is easier for them, both physically and mentally. A certain method of producing local anesthesia has been recommended for this operation, viz., blocking the pudic nerve trunk at its point of entrance into the ischio-rectal fossae. The lower rectum is enervated chiefly from the sacral plexus. Most of the nerves distributed here, such as the inferior hemorrhoidal, perineal and cutaneous are branches given off by the pudic nerve after it has entered the ischio-rectal fossae. This often proves unsuccessful, doubtless due to the fact that this region is still further supplied by certain nerves which come down through the inguinal canal, as well as others which originate independently in the coccygeal plexus. Therefore, to produce the

necessary anesthesia I infiltrate the structures all around the anus to a level well above the internal sphincter. This requires from two to four ounces of 0.5% novocain. (Novocain grs. 8, adrenalin gtts. 10, normal saline solution  $\bar{v}$ iv freshly prepared and sterilized by boiling.) The principles of this method were first described by Reclus, and have since been further elaborated by Brann. Caution should be exercised not to infiltrate within the muscular wall of the rectum, as this produces an edema of the mucosa, which renders it difficult to estimate how much should be removed at operation. If one's technique has been good the anesthesia does not involve any more discomfort than the first prick of the needle.

Anesthesia now having been accomplished, the mass, if not already protruded, is brought down by digital manipulation. The prolapsed fold of the right side is now slightly elevated, with a couple of hemostats and an incision made



with scissors at the muco-cutaneous juncture about a quarter of an inch deep. While making moderate traction in a downward direction, the three curved needles, which have been previously threaded on a linen ligature a yard long, are passed in at the line of incision and brought out at the upper part of the prolapse in the following manner. The middle needle is first passed in the centre, and the other two needles are inserted on either side of the middle one, thus dividing the fold into four equal portions. The four loops are now identified, the needles cut off, and each loop in turn tied very tightly. In this way the entire fold is completely strangulated, and as the ligatures are not interlocked, there is no occlusion of the anal canal. The operation is completed by excising a goodly portion of the mucous membrane below the ligatures, care being taken to leave enough so that they will not slip off. When the prolapse is bilateral the same procedure is carried out on the other side. It not infrequently happens that the fold on one side is much smaller than the other. In such instances one, two or three loops and, therefore, fewer needles, according to the size of the prolapse, will be found sufficient.

The bowels are moved on the second day after operation and daily thereafter with some mild aperient or cathartic. The anal region should be carefully cleansed three times daily by an experienced nurse and protected from external infection by a fluffy pad of sterile gauze. The average patient may expect to resume the activities of his normal life in a week or ten days.

Advantages of the operation.

1. It can be painlessly performed under local anesthesia, an important consideration in some of these aged debilitated patients. 2. Short operation. 3. Absence of hemorrhage. 4. The end-results are always satisfactory, and a recurrence is practically impossible. (5) This method of applying the ligatures brings about a more normal repair than any other operation. In fact, it is often impossible, after an interval of three or four months, to determine whether any operation has been performed.

#### ECONOMIC LOSS FROM TYPHOID AND MALARIA.

—In a recent address on rural health at Washington, D. C., on July 14, Senator Ransdall of Louisiana, chairman of the Senate committee on public health, estimated the annual economic loss in the United States from typhoid fever to be \$271,932,880, and that from malaria, \$694,904,750, a total of \$928,234,880, representing a per capita loss of \$9.46 from these two diseases. These figures are impressive and doubtless are, in a sense, a measure of the preventable evil of these diseases. It is to be remembered, however, that they are open to criticism on the basis of the economic fallacies to which all such hypothetical estimates are liable.

## SCIENTIFIC RESEARCH IN CHRONIC MEDICINE FROM THE PHYSIOLOGICAL POINT OF VIEW.\*

THE WORK OF THE ROBERT B. BRIGHAM HOSPITAL.

BY FRANCIS H. MCCRUDDEN, M.D., S.R., BOSTON.

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MANY persons imagine that a sharp distinction can be drawn between treatment on the one hand and research on the other; that the one is intended to help the patient, the other to satisfy the idle curiosity of the doctor concerning abstract scientific problems remote from the practical needs of the individual patient. This feeling is entirely unjustified; the term scientific search implies certain intellectual methods rather than problems of any particular nature; and such methods are as applicable to the study of conditions in an individual patient as to the more abstract problems of physiology. The nature of the problems selected for study, and the direction in which clues are followed up depend on the personal interests, opportunities, and point of view of the scientific worker.

I can best bring out the significance of these statements by giving, as a concrete example of what the physiological point of view\* implies in the way of research, a brief account of some of the work of the Robert B. Brigham Hospital—a hospital for chronic disease, all of whose activities are based on the striking foundation that the treatment of chronic disease is a problem of applied physiology, and that chronic disease can be successfully treated.

When this hospital† opened its doors about a year and a half ago, two widely different courses were open to those responsible for its character; they might have adopted the hopeless anatomical view of disease and founded a home in which decrepit men and women could receive shelter and food, and pass their declining days in peace—a dreary congeries of helpless and hopeless misery, with death as its goal; or they might have taken the stand that provision of this kind was already abundant, and that the broad point of view expressed in the will gave them a glorious opportunity to found a hospital for chronic disease where the outlook given by the physiological view of disease, not helplessness and hopelessness, but help and hope, were to be the guides, and an efficient life the goal. The decision that the broad, hopeful attitude should be taken, gave

\* Address before the Interurban Orthopedic Club, December 31, 1915.

† See F. H. McCrudden: The Treatment of Chronic Disease Is a Problem of Applied Physiology, *Boston Med. and Surg. Jour.*, July 12, 1916.

‡ Embodied under the will of Robert and Elizabeth Brigham "for the care and support, and medical and surgical treatment, of those citizens of Boston who are without the necessary means of support, and are incapable of obtaining a comfortable livelihood by reason of chronic or incurable disease or permanent physical disability."



the community, for the first time, the benefit of a hospital where this hopeful physiological aspect of the purpose and principles of therapeutics in chronic disease is definitely emphasized.

The direction thereby given to our activities by the recognition of this great truth is shown in many ways. In the organization of the medical staff, for example, we do not have several different services—medical, surgical, orthopedic, etc.—to which patients are admitted for special treatment according to the exact anatomical nature and distribution of the lesion; but we have only one service or department; and treatment is directed at improving the functional efficiency of the patient as a whole. We have the various specialists on the staff; but an individual does not come into the hospital as an "orthopedic case," for example; he comes in as a "patient." It has been interesting to observe how the point of view is reflected, too, in the attitude of the patients; there is a distinct atmosphere of cheerfulness, hopefulness, and ambition to improve. These and other details relating to organization and administration lie outside my province; and I allude to them only to bring out the fact that the character of the scientific research—my part of the work—is but one of several phases of the work, all of which reflect our hopeful physiological point of view.

In such a hospital it is impossible to restrict ourselves to methods of treatment which have been discovered and proved out elsewhere; we must, ourselves, carry on research with the view of initiating improvement. For this purpose all necessary material facilities were afforded from the very beginning; more than this, the research work was encouraged to develop entirely free from the unnecessary restrictions and handicaps that so often discourage, hinder, and even entirely prevent such work in many institutions.

The point of view regarding purpose and principles of treatment which characterizes our hospital committed us to certain lines of research; and any tendency toward getting out of touch with problems of practical therapeutic interest—a tendency sometimes found in the case of the detached laboratory worker—has been entirely averted in our laboratory by the constant stimulus coming to us from the daily observation of patients under treatment; since the purpose of treatment in chronic disease is improvement in function rather than restoration of the anatomical integrity of diseased organs, it is clear that the research should be mainly in the field of physiology and chemistry—sciences which deal with function—rather than in the less hopeful field of anatomical pathology.

The field of scientific activities thus outlined has very wide and elastic limits; we are not restricted to any one kind of work; but our point of view does give definite form to the ideas which guide us in selecting problems, and in determining in what direction to follow clues. The problems are somewhat different from those of acute medicine, where the most important prac-

tical objects of research relate to the development of exact methods of diagnosis, the discovery of direct, specific methods of treatment, and the development and establishment of schemes of preventive medicine. One of the most important objects of research in chronic medicine concerns itself with the development of methods for a more exact measurement of functional efficiency. The details of treatment in chronic medicine depend very much on the *severity* of the disease, on the *degree* to which functional efficiency is impaired. Since scarcely a beginning has been made in methods for the exact measurement of functional efficiency, estimates of the severity of impairment of function, and of the degree of change, whether for better or worse, in the severity of the disease under any form of treatment, depend on the judgment of the physician. Judgment concerning the degree of disturbance of a function like that of the circulation, depends on estimates of the severity of the dyspnea, cyanosis, weakness on exertion, and other more subtle changes; these changes cannot be very exactly measured; estimation of their severity is subject to errors of judgment on the part of both the patient and the physician; some of them, too, may be only secondary changes and not directly proportional to the severity of the disease. Contrast with this, the situation in diabetes, a situation which is the direct result of research in biological chemistry; the severity of the disease in any particular case of diabetes is proportional to the amount of sugar which the body can oxidize; and since this can be accurately measured and stated in figures, the effectiveness of the treatment, the direction in which it is leading the patient, can be quickly, accurately, and objectively measured by determining how these figures change as the result of the treatment. The advances that have been made in the treatment of diabetes have depended entirely on our ability to measure the influence of treatment on the severity of the diabetes in this immediate, accurate, and objective manner. Innumerable other examples might be cited; in many of the more complicated cases, the direct relationship of the research problems to treatment is not so clear at first sight to one who does not understand all the factors involved. These considerations show how impossible it is to draw any line between what is simply treatment and what is scientific research; and they make clear the importance of developing methods of quickly and accurately estimating the results of treatment to replace or supplement the less exact guesses of the clinician.

The following are a few examples of investigations of this character which we already have under way. A method has recently become available for accurately determining the amount of uric acid in small quantities of blood, thus giving an opportunity for investigating the truth of the alleged relationship between uric acid and gout; we are trying to determine whether the uric acid content of the blood is high in gout; whether the



amount in the blood or the amount excreted is influenced by the attack; whether treatment—atophan treatment, radium treatment, for example—can influence these factors; and whether such treatment has any influence on the clinical condition; and, finally, whether the different clinical forms of the chronic arthropathies show any differences with respect to uric acid metabolism. The investigation has been extended to compounds other than uric acid; and we have some evidence that the creatinin metabolism may possibly be of even more importance than that of uric acid. In our studies of certain types of pernicious anemia we have become convinced that a determination, with the aid of the spectroscope, of the amount of urobilin formed from the destroyed blood pigment and excreted, gives a more correct picture of the functional condition, the direction in which the disease is going, the severity of the disease, than the simple "snap-shots" of the status given at any one time by counts of the number of red cells and determination of the amount of hemoglobin in the blood. Investigations of the sugar content of the blood which we have under way, suggest that a decrease in the amount of blood sugar may, possibly, be of as much significance in certain conditions of muscular asthenia as an increase in blood sugar is in diabetes; the finding of a low blood sugar content in progressive muscular dystrophy suggested the use of therapeutic measures to increase the blood sugar content; such measures were followed by prompt improvement in the clinical condition. Investigations which we have been carrying out on the relation of the calcium metabolism to certain bone diseases belong also in this category. The findings in all these cases may well have a direct bearing on the etiology of the diseases in question; but ultimate etiology, like all other ultimate cause, has a way of receding as the investigator advances—the symptoms of diabetes, for example, were first found to be due to loss of sugar through the kidneys; this, in turn, being found due to high blood sugar; the high blood sugar to inability of the body to utilize sugar properly; the inability of the body to utilize sugar, to the absence of a certain enzyme; the absence of the enzyme to disease of the pancreas; discovery of the cause of the pancreatic disease will push the question of etiology one step further.\* Expressed from our point of view, the findings are more significant; they are concrete examples of research intended to advance therapeutics by affording a more precise estimation of the severity of the disease, and of the effect of treatment on the severity.

Two other classes of problems peculiar to chronic medicine relate, respectively, to preventive treatment, and to the possibility of radical cure in chronic disease. The problem of *preventive treatment* is one of a different nature from that of preventive medicine in acute disease; it deals with the intrinsic rather than the extrinsic

factors responsible for disease. What is to be done with persons showing congenital or acquired tendencies to different chronic diseases? Until two generations ago, it was believed that people could be classified into different types—phlegmatic, nervous, bilious, etc., and that each type has a special liability to certain definite diseases; the demonstration that infection with micro-organisms is the cause of a large proportion of acute disease; and that such infection seems to depend more on accident than on any inborn tendency, led to a shifting of the emphasis from the "soil to the seed." In recent years a further readjustment of emphasis, especially in the case of chronic disease, is bringing the question of "type," of diathesis, of the "soil" as contrasted with the "seed," again into prominence; and our physiological point of view has led us to make the facts, pointed out by the pathological anatomists, factors to be used as the basis of treatment. As an example of the kind of problem dealing with the possibility of *radical cure*: gall stones of a certain type—those composed of cholesterin—have been hitherto, even with the aid of Roentgenographic examination, often unrecognizable, and, consequently, often the cause of serious chronic disease; research carried on at the Robert B. Brigham Hospital has made it possible, in certain cases, to recognize cholesterin gall stones, so that they can be removed by surgical operation.

The problems mentioned so far are all problems peculiar to chronic medicine and problems which we have attacked with premeditated deliberation; chance, the good fortune to have suitable patients to study, has played, of course, a part in the work; but those problems were not brought to our attention by the chance occurrence of suitable cases to study; we were searching for proper patients. Another kind of problem is that coming to our attention by the chance occurrence of a case suitable for some special study, a classical example of which is familiar to everyone in the studies of gastric digestion made on the hunter Alexis St. Martin who, as the result of an accidental gunshot wound, had a permanent opening through the abdominal wall into the stomach, an opening which enabled Dr. Beaumont to study the phenomena of gastric digestion. In our hospital the long stay of patients, the excellent laboratory facilities, and the close relationship between laboratory worker and patient make this an especially fertile field. One example: in the case of a young woman upon whom colostomy had been performed, the contents of the small intestine were evacuated through the right side of the abdomen and did not pass into the large intestine; we were able to study digestion, absorption, and bacterial activity in the large and small intestine separately; and to investigate the question of the digestion and absorption of enomata in the large bowel without the usual complications resulting from the carrying down of digestive enzymes

\* Every solution of a problem is a new problem—Goethe.



from the small intestine, and to the carrying backward of the enemata into the small intestine as a result of antiperistalsis.

Studies of another kind: much valuable pathological-anatomical information is derived in most hospitals from the results of post-mortem examinations; in this hospital, the emphasis laid on physiological chemistry makes possible an extension of this kind of information so as to include chemical examination of specimens seen post-mortem. I will refer only to the data already obtained by chemical examination of bones in pathological conditions, calcified tumors, sclerosed arteries, and other pathological lime-containing material, a subject in which we are especially interested here.

Besides such problems directly attacking the border line of the known and unknown, we have had problems relating to the practical application in therapeutics of new fundamental scientific knowledge: I will refer to but one example: the application in the dietetic treatment of disease of some of the recent advances in the physiological chemistry of nutrition. The enormous amount of valuable data concerning nutrition accumulated in recent years has led to the training of dietitians and their installation in many hospitals; but even a slight acquaintance with the literature on the subject will show much criticism and great disappointment in the practical results, a disappointment that can be attributed chiefly to the failure on the part of the physician, due to lack of acquaintance with the subject, to recognize the bearing of dietetics on treatment, and make intelligent use of the facilities thus offered him. The results at this hospital have been surprisingly successful.

A problem of a still different nature relates to the mechanism and methods of actually carrying out careful and accurate scientific work in a busy hospital; of how to check and control the work—metabolism observations, for example—so as to avoid errors. In the greater part of the metabolism observations reported in the literature, nothing but the belief of the investigator is usually obtainable that the work—such an important factor even as the completeness of collection of 24-hour specimens of urine—has been carried on with accuracy and care; but even with the most reliable assistance, and with the most perfect system, such belief is of little value if not backed up by objective evidence in the form of constant creatinin excretion from day to day. In our attempts to overcome the difficulties of this problem there have been times when the question has been, not, "How to do it," but, "Can it be done?" Though to the practicing physician problems of this kind may appear abstract in their nature, remote from practical therapeutics, and therefore, the least interesting and important of the investigations, they are, as a matter of fact, very important; the correctness of the conclusions regarding any methods of treatment or the results of treatment based on

laboratory findings depends on the reliability of the results; as an absolutely indispensable part of any investigation whose ultimate purpose is the advancement of therapeutics there are usually associated these tedious and time-consuming preliminary and accessory investigations whose purpose is that of establishing the integrity of the final results; like the scaffolding and the organization necessary for the construction of a building, though they do not appear in the final results, they were indispensable in its preparation. This problem has certain very important aspects that are often difficult of solution, and for which no generally applicable formula can be given; namely, those aspects relating, not to the purely scientific part of the problem, but to personal relationships, discipline, coöperation: in order to obtain reliable results it is necessary to have all the conditions under perfect control, and this necessitates a very rigid discipline in the carrying out of the work; it is necessary, on the other hand, to have the hearty coöperation of patients, nurses, and others taking part in the investigations, and this implies, what seems at first sight the opposite condition, namely, great individual freedom. This is a big subject, a discussion of which would be out of place here; but I feel confident in saying that our success in this direction is probably unequalled elsewhere.

It is impossible to give here more than a faint adumbration of the scientific work of the Robert B. Brigham Hospital; but this is sufficient to bring out an important point; namely that it is our recognition of the physiological aspect of the problem of treatment that has determined the nature of the scientific problems selected for study, and the success which we have had in attacking them. This is significant, for it justly entitles us to credit for originality in the recognition of a great truth. The facts upon which we have based our point of view have been known before; and individual physicians have adopted this point of view with respect to certain patients and even certain chronic diseases; but the bearing of the facts on the treatment of chronic disease in general has not, heretofore, been recognized to the extent of founding an institution with this point of view as the basis for all its activities.

This fact is a vital point in determining priority in the recognition of the truth. Priority concerning the discovery and publication of a fact—often enough, indeed, the subject of dispute—can, nevertheless, usually be determined with some degree of certainty; but a determination of the originality of a truth, a point of view, is much more difficult. If the facts upon which the point of view is based have been known, and some parts of the truth have been previously recognized, it requires no great dialectical subtlety to show, by so emphasizing these known and recognized elements, that the



whole point of view is merely a restatement of old knowledge; the important thing, however, is not the elements that go to make up the truth, but the way in which these elements are selected, arranged, and emphasized; this is a matter of synthesis; and judgment regarding the potency, vitality, and originality of the point of view so developed must rest, *not on an analysis of the point of view into its original dead elements, but upon the effect resultant from adopting the point of view.* Every restatement of the facts with a new arrangement and new distribution of emphasis does not establish a new truth: the deciding factor must be whether the truth as stated is a distinct entity that has, as such, a force for stimulating and directing the activities to accomplish something new; such a truth is a live and vital thing; and its power and originality must be judged by the character and extent of these stimulating, guiding, and illuminating effects. This hospital is the first hospital where the physiological point of view regarding the purpose and principles of treating chronic disease has served to guide, direct, stimulate, and illuminate all the activities and problems of the hospital.

If the brilliant medical period of the last half century may be called the "pathological-anatomical-bacteriological," the coming period, the one foreshadowed by the activities of the newer physiological chemical investigators, may be called the "functional," or "physiological-chemical" period. *And since the Robert B. Brigham Hospital gives definite recognition to this view for the first time, it is my conviction that the inauguration of the work of this hospital is one of the most important events in recent medical history.*

### Clinical Department.

#### EPIDURAL INTRASPINAL TUMOR OF TWO YEARS' DURATION; OPERATION; RECOVERY.

By W. E. PAUL, M.D., BOSTON.

(From the Neurological Department of the Massachusetts General Hospital.)

In a recent paper, Dr. Collins and Dr. Marks, commenting on cord tumors,\* state: "Pain and other classical data are valuable but not essential phenomena.... We urge that the term atypical be discarded from the symptomatology of cord tumors. Painlessly advancing tumors are not atypical. They form a definite and important group more significant because less tangible than the classical series." The following case seems to corroborate their opinion.

\* Am. Jour. of the Med. Sciences, January 15, No. 1, Vol. clix, p. 103.

N. T. L., a rugged woman, 43 years old, single, first noticed in November, 1913, that her feet were clumsy in walking. One night she had a backache and after it found her legs more clumsy. Soon some numbness gradually developed in her feet, and she stumbled and fell down at times; it was difficult to step up to the curbstone. Hot water was not felt by the left foot and the numbness began to increase upward in the left leg so that she did not feel the prick of a pin in it. The right leg was weak, but a pin prick and heat were recognized. There was no pain or tenderness and the sphincters were unimpaired. Some eight weeks elapsed during which the foregoing symptoms developed. On Dr. Putnam's advice, she then entered the Massachusetts General Hospital, in January, 1914. Examination showed the pupils equal and they reacted well to light and distance; the knee jerks were lively, especially the right; the position sense in the toes was normal; the ankle jerks were present; Babinski was suggested on the right but there was no clonus; the abdominal reflexes were not obtained; touch was felt everywhere without apparent loss; the temperature and pain senses were diminished throughout the left leg and left half of the trunk to a level just above the umbilicus; on the right there was also impairment of pain and temperature appreciations. The gait was notably unsteady. Both the blood and spinal fluid were negative to the Wassermann test. The x-ray revealed nothing abnormal in the vertebrae. The case was deemed a syringomyelia.

In December, 1914, N. T. L. reentered the hospital with accentuation of her previous symptoms. The gait was more ataxic and she stumbled and fell frequently. A Babinski was present on the right. The touch sense was everywhere preserved but pain and temperature were appreciated very imperfectly up to the eighth dorsal level. She was again sent home as a case of syringomyelia.

August 3, 1915, she entered the hospital a third time and was hardly able to get about even by taking hold of chairs. She had a marked Romberg; a clonus had developed on the right and there was a double patella clonus; Babinski existed on the right only. Reinforcement brought out the Babinski and clonus.

Touch sense was preserved but pain and temperature senses were practically lost up to the sixth dorsal level. Hard pulling of the pubic hair was painless. The level of loss was somewhat higher on the left. Though touch was appreciated everywhere, the change of sensation at the sixth dorsal level was determined by the pin point as being different and less natural below this level than above it; it was not determined by sharp delimitation of pain and temperature sensibility at this level.

The spinal fluid showed as follows at the three different times she was house patient:

	Jan. 9, 1914.	December, 1914.	August, 1915
Pressure	150	(No record)	210
Cell count	8	1	5
Noguchi	3 plus	Strongly positive	Strongly positive
Gold	Pathologic	Syphilis	Syphilis
chloride	neg. for syphilis		or non-tuberculous
Alcohol	(No record)	Strongly positive	Moderately positive
Wassermann	Negative	Negative	Negative
Roemer	(No record)	Very faintly positive	Moderately positive



The objective symptoms pointed to intramedullary disease of the cord, and in the first eight weeks of the disease it was regarded as a myelitis. Later the evidence seemed to justify the view that syringomyelia existed.

At the last visit in August, 1915, the suspicion of a tumor other than gliosis was strengthened by the partial degree of spinal impairment combined with the marked level of sensory change at the sixth dorsal segment. Inasmuch as the future was hopeless if nothing were done, an exploratory laminectomy was advised. The third, fourth, fifth and sixth dorsal spines were removed and the fourth, fifth and sixth laminae, by Dr. W. J. Mixer, on August 17. A tumor presented at the fifth dorsal level protruding posteriorly and extending transversely. It was unattached except at the point of emergence of the fifth right dorsal root, and when cut free, the tumor was lifted off with the escape of considerable cerebrospinal fluid. The tumor was irregular, lobulated, 4 by 2 cm.; a cup-like depression existed in the fifth dorsal vertebra conforming to the tumor.

Dr. J. H. Wright's pathological report follows:

"An irregular spherical mass of tissue 3 cm. in greatest dimension. Microscopic examination of a paraffin section shows a tissue very rich in delicate fibrils among which are scattered rather small nuclei. The nuclei are frequently disposed in groups. The fibrils are frequently arranged in small bundles lying parallel to one another. Mallory's phosphotungstic acid haematoxylin fails to stain the fibrils blue. Fibrosarcoma."

Surgical recovery was uncomplicated and functional return was very rapid, so that at the end of eight weeks after removal of the neoplasm the use of the legs seemed practically normal and sensory restoration had taken place. The reflexes were still active but the Babinski and clonus had disappeared. I had told the patient I would be satisfied when she could hop on either foot, and she now executes a very creditable hop. Six months after the operation she states she is able to use her legs as well as ever she was.

It would be of interest to examine the progress of symptoms from cord pressure to determine whether any typical order existed. Are all the nerve tracts affected alike? Do they fail one after another with a certain order of functional block? In this case there was successive failure of tracts, and the order approximately was (1) posterior columns; (2) lateral tracts; (3) antero-lateral tracts; (4) sphincter-controlling tracts. Least vulnerable were the tracts conveying touch sense. The order of severity is practically the same as that for invasion. And in keeping with the right-sided location of the tumor is the partial Brown-Séquard distribution of symptoms suggested by the greater spasticity on the right and by the greater sensory impairment on the left.

The time development of symptoms as well perhaps as the absence of subjective pain indicates the effects of the pressure were chiefly on the columnar tracts and not on the roots or commissural crossings of the temperature and pain tracts.

## PATHOLOGY OF CLAVUS (SOFT CORN).

By HENRY M. CHASE, M.D., F.A.C.S., BOSTON.

OLD DEFINITION: Small, circumscribed, horny elevation appearing upon the feet. When bathed in perspiration, they become more or less macerated and in this condition constitute the so-called soft corn.

The writer herewith presents a series of observations which will modify our interpretation of a condition which by most people is thought to belong to the care of the chiropodist; by others, as too annoying or too humiliating to discuss; by others not of sufficient magnitude to justify a medical expense.

It is a condition patiently, and as far as possible secretly, borne by most people. It is reasonably a cause of painful feet, for the origin of which search has been made elsewhere. It is a permanently curable condition.

CASE 1. J. W. Pain and redness above little toe. Thickened, moist epithelium between fourth and fifth toes. Examination shows a small infected sinus opening on one side of thickened epithelial area. Cocaine. Careful dissection of tortuous channel as outlined in Fig I A. At the bottom of the channel the glistening surface of the tendon of the plantar flexor of the little toe could be seen moving in its sheath with motion of the toe.

Fig. I B shows channel after dissection of the thickened epithelium and excision of the sinus.

Fig. I C, final cicatricial healing by granulation. Operation Nov. 14, 1912, healed Nov. 25, 1912. Now three years and four months. No recurrence.

CASE 2. W. B. A. Consultation in September, 1913, for pain about and below the external malleolus and along the fourth and fifth metatarsals, slight pronation. Pain thought to be due to static conditions, and so treated.

Not seen again for a year.

History in September, 1914. Soft corn between fourth and fifth toes for a year, apparent infection the last few days. Mild lymphangitis.

Sept. 30, 1914. Cocaine. Excision of thickened epithelium. Opening of sinus followed to dilated sac as in Fig. II A, at one side of which glistening tendon could be seen. Dilated channel not excised, wiped with carbolic and alcohol, packed with gauze (Fig. II B) followed by moderate discomfort.

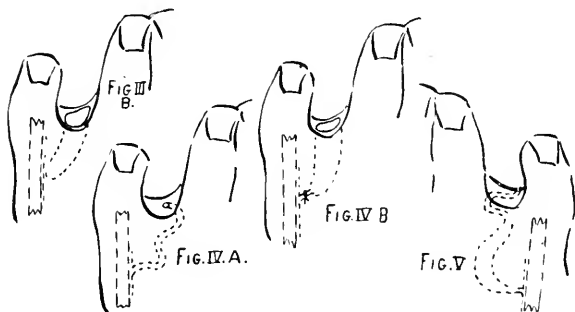
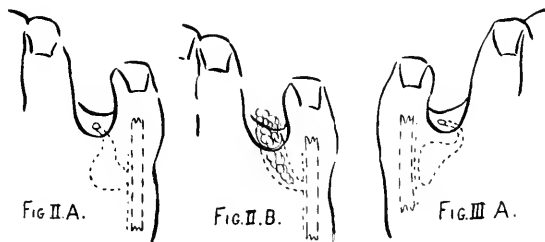
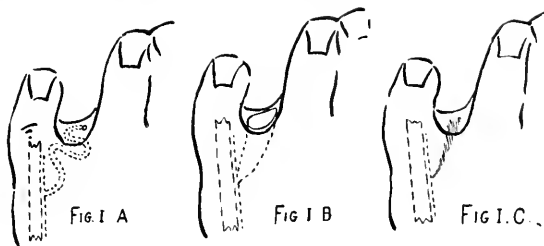
Oct. 16, 1914. Escape of large amount of clear fluid (? from tendon sheath) carbolyzed and packed again. Followed by moderate discomfort.

Dec. 10, 1914. Cocaine. Excision of funnel-shaped channel. No carbolic, no packing. Dry gauze between toes. Plantar splint, transverse strapping of foot. No discomfort. Healed rapidly. Now one year, three months. No recurrence.

CASE 3. R. M. A. Feb. 22, 1914. Watery secretion and tenderness between fourth and fifth toes for several months.

Cocaine. Thickened epithelial surface excised and narrow funnel-shaped canal leading to dilated area adjacent and adherent to, but not apparently opening into, the plantar flexor tendon sheath of the little toe. Fig III A.





Carbolized and packed. Gauze removed in 48 hours. Fig. III B.

Sac apparently not sufficiently cauterized. Wiped with iodine, strapped and kept clean. Healed March 22, 1914. Now two years. No recurrence.

CASE 4. S. A. March 15, 1915. For six years has had a soft corn between fourth and fifth toes—healing and opening. Thick macerated skin one-fourth inch in diameter on outer side of fourth toe on left foot. A depression in the centre as of opening from below. Fig. IV A.

Cocaine and adrenalin. Tourniquet.

Macerated area excised and funnel-shaped sinus isolated to tendon sheath. Funnel ligated with fine iodized silk close to the tendon sheath, and excised. Wound wiped with iodine. Dry dressing. Fig. IV B.

This case had a long duration. The tie exfoliated and the wound closed to a fistulous tract secreting lymph. It was cocaineized and wiped with carbolic or iodine four times as each new funnel appeared to form. It really needed to have the foot securely strapped and the toe held still. It then healed in a very few days. Now one year. No recurrence.

CASE 5. M. F. (Referred by Dr. O. G. Tinkham.) March 9, 1916. Soft corn between fourth and fifth toes for three and one-half years. History of mild infection, off and on. Recently, for three weeks, tender, with lymphangitis along dorsum of foot over fourth metatarsal.

Cocaine. Bleeding controlled with pressure of hand of my associate. Probe enters opening in macerated area and demonstrates a sinus just below the epithelium. Skin excised and tortuous channel followed as outlined in Fig. V.

Funnel dissected and excised, exposing the gliding tendon of the plantar flexor.

Wound drained with small wick because of the lymphangitis. Removed in 48 hours since there was no discomfort. Foot strapped and gauze changed between the toes. Healed March 30th, 1916.

#### CONCLUSIONS.

Clavus, or soft corn, presents, on the surface, an area of thickened epidermis, moistened and at times macerated by discharge of lymph through an opening in the thickened area. This,



opening leads through a direct or indirect tortuous channel into the subcutaneous areolar tissue.

This lymph channel may or may not connect with a tendon sheath. It varies in length, according to its tortuous direction, from one to one and one-fourth inches in depth.

In none of the cases has it been possible to probe the sinus until the thickened epidermal layer has been removed as shown by the sharp change in direction of the channel.

*Treatment.* Dissection and excision of the lymph sac. If wall tears and is too thin to excise, wipe with carbolic acid and insert small wick for 48 hours.

Transverse adhesive strapping the entire length of the metatarsals. Keep the toes still. Change gauze dressing as necessary, lymph secretion may be slight or excessive for several days.

Healing by granulation and permanent cure.

of esophagus and cardia. This was sutured with great difficulty. A gauze walling-off drain was inserted between liver and stomach. Another gauze below stomach and a large drain to the back of abdominal cavity.

He was put to bed in good condition.

For first week was given nothing by mouth but sips of water, and was fed with peptonized food by rectum.

Fifth or sixth day gauze removed and new wicks reinserted.

In a few days I thought there was some leakage of gas. The morning after operation the nurse reported large amount of blood in urine. I was never able to find any blood visible in urine afterwards. It is possible that the left kidney may have been wounded.

After first week patient fed by stomach. Purulent fluid was taken care of by the long drain and later by a tube.

Patient discharged with slight sinus April 29, 1916. Later in June I saw him in Court House in New Bedford in perfect health.

## PISTOL-SHOT WOUND OF THE STOMACH.

By CHARLES A. ATWOOD, M.D., TAUNTON, MASS.

*Surgeon to Morton Hospital.*

MARCH 9, 1916. T. G., 35 years of age, single, Italian, employed at Mount Hope Finishing Company, and residing at Taunton, got into an altercation with another Italian, A. A., who demanded that G. give up his money. This, G. refused, and A. proceeded to empty a 38-calibre revolver at G., while the latter was running away. One bullet took effect in G.'s back. G. ran several hundred yards, to the railroad station, where he fell in a collapsed condition.

He was taken to Morton Hospital, where I saw him a short time after the accident. General condition good. There is a bullet wound of entrance in left back, apparently just above left kidney region. Abdomen rigid. The bullet can be felt in the anterior abdominal wall midway between the xiphoid cartilage and the umbilicus.

The patient was immediately prepared on the table for laparotomy.

Incision made through right rectus, bullet removed and abdominal cavity opened.

The anterior wall of stomach shows wound of exit of bullet. There is also a wound (slight) of the liver. Field walled off with gauze. Wound in liver packed. Anterior wound of stomach closed with interrupted chromic gut stitches, then infolded and sewed over by Lambert continuous suture. Opening made into cavity of great omentum between stomach and transverse colon. Stomach turned up.

I was at a loss to find posterior opening, and there was a leakage of stomach contents, with the odor of sour beer in considerable quantity. The posterior opening was found high up, at junction

## Book Reviews.

*The Umbilicus and Its Diseases.* By THOMAS STEPHEN CULLEN, Associate Professor of Gynecology in the Johns Hopkins University, Assistant Visiting Gynecologist to the Johns Hopkins Hospital. Illustrated by MAX BRÜDEL. Philadelphia and London: W. B. Saunders Company, 1916.

This monograph deals with the embryology, anatomy, and diseases of the umbilicus, together with those of the urachus. It should hardly seem, at casual thought, that there would be enough material on this subject for more than a brief treatise, yet the author has produced a large quarto of 680 pages. It constitutes a really complete survey of the literature upon the umbilicus and urachus, with the exception of umbilical hernia, and this survey is enriched with a large amount of original observation. Three-quarters of the volume are devoted to the umbilicus, one-fourth to the urachus, and the whole profusely illustrated with 269 text-figures and 7 plates, many of them original and some colored. The work is one of the best Teutonic type of thoroughness and value, written by an American in a charming and delightful English literary style unusual among physicians.



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126 Massachusetts Ave., Corner Boylston St., Boston, Massachusetts.

## PREVALENCE OF POLIOMYELITIS.

DURING the past week the prevalence of poliomyelitis has diminished in New York and increased in Massachusetts. On July 22 the number of cases in New York reached a total of 2662, with 558 deaths; and in New York State, outside of New York City, 195 cases and 16 deaths had been reported.

In Massachusetts on July 23 the total number of cases since July 1 was 71, of which 8 were in Westfield, 6 in New Bedford, 5 each in North Adams and Worcester, 3 each in Fall River and Dudley, 2 each in Lowell, Lawrence, Pittsfield, Newton and Medway, and 1 each in Maynard, Marlboro, Sheffield, Greenfield, Hawley, Holyoke, Norwood, Haverhill, Boston, Greenfield, West Hanover, Raynham, Malden, Palmer, Natick, Dartmouth and Springfield.

Elsewhere in New England other new cases have been reported as follows: At Pawtucket, R. I., 4 new cases and no deaths; at Valley

Falls, R. I., 1 case; at New Haven and at Bridgeport, Conn., 1 death each, and 1 new case at New Haven. The total number of cases now in Rhode Island is 22, and in Connecticut 59. Many of the New England cases are contacts from New York. Elsewhere in the United States the disease is chiefly prevalent in Illinois, where, on July 11, there was a total of 27 cases, and in New Jersey, where the total of reported cases on July 22 was 239.

In New York City extensive measures are being taken to combat the epidemic.

A conference was held at the Department of Health on July 6 to discuss, particularly, lines of investigation to be pursued during the present epidemic in order to learn more about the spread of the disease. Those present were Commissioner Emerson, Dr. William H. Park, Director of the Department's Laboratories, Dr. Louis C. Ager, Dr. George Draper of the Rockefeller Institute, Dr. Abraham Sophian, Dr. S. Josephine Baker, Director of the Department's Bureau of Child Hygiene, Dr. Josephine B. Neal and Dr. Charles Bolduan.

Commissioner Emerson reported to the Committee that he had met the Hon. William G. McAdoo, Secretary of the Treasury, at a conference at the Mayor's office, and that Secretary McAdoo had offered the services of the United States Public Health Service to the city to help stamp out the epidemic. The offer was gladly accepted and the Committee decided that the United States Public Health Service should be requested to take up especially the very difficult "carrier" problem, and should make both field epidemiological studies and laboratory studies with animal inoculations. According to the Committee, there was plenty of work in this field for at least six skilled investigators.

The laboratory investigations are very much hampered by the lack of monkeys. The Rockefeller Institute reports having over one hundred monkeys ready for shipment from the Philippine Islands, but that at present there is an embargo due to the presence on the Islands of certain animal diseases. The Committee requested Commissioner Emerson to enlist the aid of the United States Public Health Service to pass these shipments.

A letter will be sent to all large hospitals having well-equipped pathological departments, asking them to send material from fatal cases to the Health Department for examination and research study.



In pursuance of the offer of the United States Public Health Service, Secretary McAdoo, on July 11, requested from Congress an appropriation of \$135,000, to finance the work in New York. This appropriation was granted, and in addition the following resolution was adopted:

*Resolved*, That until Nov. 1, 1916, the Secretary of Labor be and he is hereby authorized in his discretion to utilize the available hospital facilities at the immigration station at Ellis Island, New York Harbor, for the purpose of housing and caring for indisposed persons from the city of New York and vicinity, under such conditions as the secretary of labor may prescribe, and without any expense to the United States Government; and all expenses for the maintenance of such buildings and damages sustained, as the result of the use thereof, shall be borne by the City or State of New York, or both."

On July 10, at Washington, D. C., a meeting was held of the general board of the Public Health Service, consisting of Surgeon-General Blue and Assistant Surgeons-General Glennan, Simpson, and Rucker. The first step taken as a result of the action of this conference was to order all railway and trolley cars entering or leaving New York City to be thoroughly cleaned and disinfected. To prevent the interstate spread of the disease will be the first aim of the work, and the second will be to undertake the scientific research into the problem of carriers and of the transmission of the disease. The United States Public Health Service has detailed the following officers to take charge of the work in New York: Dr. William C. Rucker, Dr. J. B. Stoner, Dr. Francis Edward, Dr. J. R. Riddon, Dr. J. R. Leake, Dr. C. W. Chaplin, Dr. J. G. Wilson, Dr. R. H. Heterick, Dr. Louis Schwartz, Dr. L. L. Williams, Jr., and Dr. T. A. Hughes.

On July 15 it was announced that the Rockefeller Foundation has appropriated the sum of \$50,000 as a contribution to finance the cost of combating the disease. With this money the New York Health Department has opened a new bureau, under direction of Dr. Alvah H. Doty to trace contacts and maintain a complete registry of cases.

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#### TESTS FOR AIRMEN.

With the conquest of a new element, there has come a new set of medical problems arising from the action of an unfamiliar medium on the human organism. Besides the actual phys-

ical effects of alteration in the air pressure and rarefaction of the atmosphere, there are psychological effects which have been found to incapacitate many a would-be aviator. Airmen must, in fact, be picked men, especially if they are to be called upon for military duty, where, in addition to their ordinary functions, they must add those of attack and defense.

Realizing this, the French have devised a method of examination for applicants for the position of aviator, which, in addition to the ordinary physical examination which is given all recruits, comprises certain psychological tests. It is essential that the candidate's sense perceptions be in good order, so his quickness of response to auditory, visual and tactile impression is tested. Even more important, however, is the question of the stability of his emotional mechanism. He must not be unduly excitable, apprehensive or nervous.

The methods of exposing these defects seem rather spectacular, although it is probable that time will make commonplaces of many of these tests. The well-known smoked drum of the physiological laboratory is so arranged as to record the cardiac rhythm, the respiratory rhythm, the vasomotor tone, and the occurrence of muscular tremor. The candidate is then tried with unexpected noises—revolvers are fired off near him, and other loud noises made in his vicinity. Magnesium powder is ignited without warning, and searchlights flashed in his eyes to test his reaction to unexpected visual stimuli. Cold cloths are then applied suddenly to exposed parts of his skin and needles thrust into him.

The ideal candidate shows such slight reaction to these tests that his tracings show little or no change. Some candidates will react somewhat at first, until the purpose of the test is explained to them; they are then able to control their emotions completely. Other candidates show such marked tremor and irregularities in their heart action that it is considered probable that they would not be capable of handling an aeroplane in the presence of hostile forces, and these men are weeded out. Of course it is probable that some candidates are thus rejected who would not waver in the presence of actual danger, but probably the decision in most cases is a just one; certainly it is a more scientific way of going about the thing than the forming of a judgment based merely on the impression which a candidate makes on the examiner.



## MORE REPORTS OF APRAXIA.

A RATHER detailed report of a case of bilateral motor apraxia by Drs. Smith and Holmes, published in the *British Medical Journal* for March 25, reminds us of the fact that accounts of this rare and interesting condition are all too infrequent. The term dates back to its use by Gogol in 1873, although the phenomenon had been described before, notably by Hughlings Jackson, Quaglino, and Fikelnberg. Recent studies have been made by Liepmann, Pick, von Monakow, d'Hollander, and Wilson. The best report which has been made in American medical literature is that of Glasecock in 1913.

Too often apraxia is accompanied by such general psychic loss that the symptoms are overlooked. Such cases are found in asylums, and spoken of as being very demented, greatly deteriorated, etc. If these cases were more thoroughly investigated our knowledge of the condition would be more definite, and it would add, of course, to our knowledge of the functions of the various parts of the cortex. At present we can only say that apraxia results from a diaschisis of the left frontal area from the right frontal area.

The patient of Drs. Smith and Holmes confused yawning and whistling, was unable to use knife and fork correctly, or to shuffle cards, unable to correct the faulty position of a book handed him, showed difficulty in performing acts connected with smoking, although he was an ardent smoker, was unable to make movements of brushing his teeth or of washing his hands. There were also some disturbances of visual orientation and localization, so that he failed to appreciate the relative distance of two objects from him, and became lost in going from one part of the ward to the other.

The most disabling injuries in war are those of the skull, and these are common in trench warfare, which seems to be the approved modern method of fighting with infantry. This is due partly to the fact that the head is the most exposed part of the body in the trenches and to the frequency of enfilading fire. The more the profession learns about head injuries and their sequelae, the better will it be prepared for the exigencies of war.

## MEDICAL NOTES.

**PREVALENCE OF MALARIA, MENINGITIS, SMALL-POX AND TYPHOID FEVER.**—The weekly report of the United States Public Health Service for July 7 states that during the month of May, 1916, there were reported in California 114 cases of malaria, 9 of cerebro-spinal meningitis, 7 of pellagra, 18 of smallpox and 121 of typhoid fever. During the same period there were 146 cases of smallpox in Iowa, and in Montana 80 cases of smallpox and 18 of typhoid.

**AWARD OF VICTORIA CROSS TO A PHYSICIAN.**—In the *London Gazette* of June 21 it is announced that the Victoria Cross has been awarded to Captain John Alexander Sinton, M.B., I.M.S., for most conspicuous bravery and devotion to duty. "Although shot through both arms and through the side, he refused to go to hospital, and remained, as long as daylight lasted, attending to his duties under very heavy fire. In three previous actions Captain Sinton displayed the utmost bravery."

**ROCKEFELLER YELLOW FEVER COMMISSION.**—On June 14 the yellow fever commission of the International Health Board of the Rockefeller Foundation, under command of General William C. Gorgas, U.S.A., sailed from New York to study sanitary conditions in the Panama Canal Zone and on the west coast of South America, particularly with reference to the prevalence of yellow fever. This commission, which consists of six members besides General Gorgas, landed, on July 12, at Lima, Peru, to investigate sanitary conditions at the Port of Iquitos.

**WEIR MITCHELL MEMORIAL.**—The new dispensary building of the Philadelphia Orthopedic Hospital and Infirmary for Nervous Diseases has been formally dedicated to the memory of Dr. S. Weir Mitchell, a founder of the institution and for many years chief of its hospital staff. Suitable tablets have been placed in the building, stating that it is dedicated to Dr. Mitchell's memory by his friends and patients. The dedicatory address on this occasion was delivered by Dr. William W. Keen.

**HONORARY DEGREE FOR A PHYSICIAN.**—At the recent convocation of the University of Chicago in celebration of its twenty-fifth anniversary, the honorary degree of ScD. was conferred on Dr. Otto K. O. Folin, Hamilton Kuhn Professor of Biological Chemistry in the Harvard Medical School.

**BRAZILIAN ACADEMY OF SCIENCES.**—At the May meeting of the National Academy of Sciences at Rio de Janeiro, Brazil, Dr. Tom A. Williams, of Washington, D. C., was elected corresponding member for the United States.



**VARIATIONS IN COST OF DRUGS.**—During the past month the prices of various drugs affected by the European War have continued to fluctuate with perhaps a general tendency to decline, owing, in certain instances, such as aspirin, to the change in seasonal demand. On June 10, 1916, crude opium sold at \$11.50 a pound, antipyrin at \$30.00 a pound, caffeine and phenolphthalein at \$20.00 a pound and santalin at \$38.00. Among the drugs which have shown the highest advance in price are antipyrin, 2700%; potassium bromide, 1150%; potassium acetate, 800%; cod liver oil, 700%; caffeine, 370%; Epsom salts, 250%; and quinine, 200%.

Report from New York on July 7 contains the following statement of market conditions of certain drug products on that date:

"Spot quotations for caffeine alkaloid were given yesterday as \$16.50 to \$17.50 per pound. Demand for quinine is gradually increasing, as larger quantities are required in Mexico for the troops. Sellers quote 70 and 72½ cents, the outside quotation being more general. A sharp decline is noted in oxalic acid, which has been lowered to 56 cents per pound following the larger production. Norwegian oxalic is nominal owing to scarcity. Salicylic acid was easy at \$2.90. Citric and tartaric were quiet and somewhat easier."

Further report from New York on July 19 notes a recent sudden decline in the market cost of bromides, quinine, and caffeine alkaloid.

#### EUROPEAN WAR NOTES.

**AMERICAN FIELD AMBULANCE.**—Report from Paris on July 14 states that the field section of the American Ambulance Hospital at Neuilly has been separated from the main organization and established as an independent unit with 150 cars under command of A. Piatt Andrew of Gloucester, Mass., and Stephen Gallatin of New York:

"Of the cars now in service, 125 are on the Verdun front. New cars are being fitted out and young men are coming from the United States to drive them, so that by the end of August, 200 cars will be in service, or five times as many as a year ago. The field ambulance will have a suburban villa, where the drivers can rest when on furlough from the front. The unit now has its own repair stations at Billancourt, close to Paris."

**SELECTION OF WOUNDED FOR TREATMENT.**—A recent quotation from a French scientific journal gives some interesting facts about the manner in which great numbers of wounded soldiers are cared for by the first aid hospitals. During a period of attack when the army surgeons are called upon to care for an overwhelming number of wounded in a short space of time, those

suffering from wounds in the legs are chosen first. Wounds in the body, experience has shown, are best attended to in the base hospitals and better results can be obtained if these cases are sent directly to those hospitals without preliminary operations by the stations at the front. Wounds of the arm, less likely to become seriously infected than the leg, are preferably sent to interior hospitals where every effort can be made to prevent the loss of the hand. While the ambulances of the medical department have proved adequate in every way, even for severe operations, it has been found desirable, for the psychological effect upon the patient, to perform such services beyond the firing lines and in the zones of comparative safety where the base hospitals are located.

**AUSTRO-GERMAN MEDICAL CONGRESS.**—The Austro-German Medical Congress, whose occurrence we noted in previous issues of the JOURNAL, was held at Warsaw from May 1 to 3, and summarized reports of it have now appeared in the German and English medical periodicals. The address of welcome was delivered by His Excellency General von Beseler, governor of Warsaw and chief of the German Army Medical Service. Professor von Schjerning then gave an account and interesting survey of the organization of the German medical service.

"There were, he said, more than 24,000 doctors in the service of the army, of whom 16,000 were actively employed at the front. Besides these, the Army Medical Service included 3000 doctors employed in Red Cross work, 400 surgeon-dentists, 1800 pharmacists, and 92,000 men in the sanitary and ambulance departments. These were assisted by 72,000 voluntary nurses, male and female, at the base hospitals, and 22,000 in the war zone. Thousands of motor-cars and vans were engaged in transporting the sick and wounded to the war hospitals, of which there were 238 in the whole country. There were also thousands of installations for the sterilization of water, for disinfection, and x-ray examinations; 26 large mobile steam laundries were kept busy day and night for the military hospitals alone; and there were 18 large disinfecting stations through which 100,000 men could be passed daily and their clothes dealt with. The central medical depot forwarded to the front daily wagon-loads of medical preparations and surgical appliances. Surgeon-General His, the President of the Congress, spoke of the successes hitherto attained in combating epidemics, asserting that 'in spite of typhus and dysentery, spotted fever and cholera, the efficiency of the troops has never been impaired.' Several scientific investigators had lost their lives during the war in combating these and other invisible enemies, amongst them Cornet Prowazek, Lüthje, Joehmann, Römer, and Tilp. New diseases had been discovered, to one of which the name of 'five-day fever' had been



given. Well-known diseases, such as typhoid and dysentery, appeared in modified form, owing to previous inoculation."

With regard to the incidence of Asiatic cholera, an extensive statement was made by Colonel S. A. Hoffmann.

"He stated that Galicia had suffered terribly from the disease, which had also made its appearance among the German troops on the Polish frontier. The sickness rate, however, even among troops who had in the height of summer traversed the cholera-stricken Galicia and the Rokitno marshes, did not exceed 0.5%, or a quarter of the rate prevalent in the Greek army. Owing to the success of the inoculation carried on among the armies in October, 1914, only 10.2% of those attacked died, whereas the ease mortality among the uninoculated troops reached the high figure of 50%. In August, 1914, cholera broke out in Warsaw, and by September it had already infected 12,000 soldiers in the Serbian army. Isolated cases had also been detected in Germany, but thanks to prophylactic measures, only 78 German civilians had contracted cholera up to January, 1916. He attributed this relative immunity of the civilian population to inoculation, which had been almost completed when, in November, 1914, the first cases of cholera appeared in the army and among Russian prisoners. He did not give the figures for the German army, but he admitted that when the Germans were advancing in the region of the Bug and the Rokitno marshes, the morbidity among the German troops was 0.52%. The mortality among those attacked by the disease, which was 50 to 35%, was reduced by inoculation to from 20 to 10%. By killing cultures at a temperature 3 to 5° C. lower than before, the resulting vaccine, even when administered twice, had been found in most cases not to provoke a troublesome reaction. Inoculation had to be repeated after half a year, as the immunity conferred did not last more than seven to nine months. In addition to inoculation, the campaign against cholera was carried out by strict hygiene, which included the prohibition of drinking unboiled water and a ceaseless war on flies. From the beginning of the war to Jan. 1, 1916, the morbidity from cholera represented only 0.065% of the average strength of the army in the field and only 0.005% of the army of occupation. He touched on the part played by carriers, and stated that in one prisoners' camp 5 out of 600 healthy men proved to be carriers. Another speaker, Dr. Schemensky, drew attention to the difference in mortality when patients were nursed in bed or on the ground: it was 30% among the former, 45% among the latter.

"Professor Kaup, representing the Austro-Hungarian army, said that after the soldiers had been inoculated the morbidity was only 1 to 5%; even when exposure to infection was great, the course of the disease was strikingly

mild, and the mortality was only 0 to 20%, whereas the mortality among the uninoculated was 40 to 60%. As the immunity conferred by inoculation lasted only three to four months, it was repeated after three months if the soldiers were exposed to infection. On these occasions a single injection of 2 c.cm. of vaccine was sufficient."

**WAR RELIEF FUNDS.**—On July 22 the totals of the principal New England relief funds for the European War reached the following amounts:

Belgian Fund .....	\$133,945.12
Allied Fund .....	125,532.00
French Wounded Fund .....	100,102.43
Army Hut Fund .....	73,351.60
British Imperial Fund .....	61,118.90
French Orphanage Fund .....	57,563.30
Armenian Fund .....	54,832.77
Polish Fund .....	54,832.77
Surgical Dressings Fund .....	39,433.87
Belgian Tobacco Fund .....	31,495.88
Facial Hospital Fund .....	23,135.51
Permanent Blind Fund .....	2,883.13

#### MEXICAN NOTES.

**AMERICAN RED CROSS.**—In connection with the mobilization of our troops on our southwestern border, the American Red Cross has undertaken to collect and distribute soldiers' gifts and other relief supplies, and the various express companies have cordially coöperated in this humanitarian work and will accept such shipments at *two-thirds* of the regular rate.

Supplies contributed should fall within the following approved list only:

Reading matter, games, comfort bags, pajamas, cotton socks (medium weight, large sizes), towels, pipes and smoking tobacco, cigarettes, electric fans (to hospitals), chewing gum, chocolate in tin boxes, hard candies, instantaneous coffee, evaporated cream, and canned fruits and other delicacies in tins.

Surgical dressings and hospital supplies will be acceptable if made according to directions in Red Cross Circular No. 115. (For copies of same, address Bureau of Supplies, American Red Cross, Washington, D.C.)

Depots for the collection and distribution of supplies have been established at various points as follows:

1. Red Cross Supply Depot, Bush Terminal No. 19, South Brooklyn, N. Y.
2. Red Cross Supply Depot, 219 East Second street, Cincinnati, Ohio.
3. Red Cross Supply Depot, Clearing, Argo District, Chicago, Ill.
4. Red Cross Supply Depot, c/o Montgomery, Ward & Co., Kansas City, Mo.
5. Red Cross Supply Depot, Denver, Colo.
6. Red Cross Supply Depot, c/o Mr. A. B. C. Dohrmann, San Francisco, Cal.



7. Red Cross Supply Depot, c/o Mayor W. H. Adamson, Douglas, Ariz.

8. Red Cross Supply Depot, 516 San Francisco street, El Paso, Texas.

9. Red Cross Supply Depot, Avenue E and Fourth Street, San Antonio, Texas.

Contributions should be *prepaid* to the appropriate depot, whence shipments will be forwarded, without further charge to the contributor, to the troops at the front.

Enquire of local express agent as to depot to which *your* supplies should be sent.

N. B. Supplies cannot be accepted which are intended to be forwarded separately to designated individuals. Those who wish to send packages to particular persons are advised to employ the parcel post or express service, such service being at *regular* rates. Supplies intended for designated companies or regiments may be accepted for forwarding with the understanding that if such delivery is found to be impracticable these supplies may be donated to other troops.

In connection with the appeal of the Chairman of the Central Committee, Mr. Taft, dated June 26, 1916, for funds for aid to our soldiers and sailors on or near the Mexican border, which appeal, it is to be regretted, has been poorly responded to, numerous letters showing splendid work done by two chapters in giving needed aid and comfort to soldiers en route to the border, and the special need of financial assistance in carrying on this good work have been received.

Press reports indicate that other Red Cross Chapters along the routes followed by the troop trains exerted themselves in like manner early and late to provide comforts and necessities for militiamen.

It is just such good, patriotic and humanitarian work as this that will cause the name of the American Red Cross to be revered by every recipient of the timely aid and comfort given by it, and it is sincerely hoped that these illustrative letters of good Red Cross work may be the means of causing such of our chapters and auxiliaries as have not had an opportunity to take part in such work, to contribute liberally toward its continuance by those chapters which are called upon to do it.

Contributions should be sent to the American Red Cross, Washington, D. C., with purposes for which they are intended plainly stated.

ARTHUR MURRAY,

*Major General, U. S. A., (Retired),  
Acting Chairman, Central Committee.*

**APPEAL FOR SURGICAL DRESSINGS.**—The Surgical Dressings Committee of the National Civics Federation, which has been sending extensive supplies of surgical dressings to the Allied powers in the European War, has recently issued the following appeal for funds to enable it to undertake the additional labor of

furnishing dressings for United States troops on the Mexican border:

"As a result of the sudden mobilization of the United States troops on the Mexican border, the Surgical Dressings Committee finds its field of work greatly enlarged, with constantly increasing demands upon its resources.

Further contributions are, therefore, urgently needed. Checks may be sent to the Surgical Dressings Committee, care of Old Colony Trust Company. Those wishing their subscriptions to be used exclusively for the United States troops will please mark them 'Home Relief.'

MRS. FREDERICK S. MEAD,

*Chairman,*

MRS. HENRY B. CHAPIN,

MRS. LIVINGSTON CUSHING,

MISS ROSE L. DEXTER,

MRS. RICHARD M. SALTONSTALL,

*Acting Members Executive Committee."*

**CIVILIAN NURSES NEEDED.**—On July 12 a call was issued from the United States War Department at Washington, D. C., for several hundred civilian nurses to join the Army Nurse Corps, to fill the six base hospitals which have been established on the Mexican border.

"There are at present approximately 3000 beds in the six hospitals. To attend these, medical regulations call for 45 nurses and one chief nurse to every 500 beds. This will necessitate the employment of 276 additional nurses.

"None but graduate nurses will be accepted by the department, and they will receive a compensation of \$50 a month and maintenance and laundry during their employment. All candidates must be graduates and certified practitioners, must have studied in a school connected with a hospital containing not less than 100 beds, and pass mental and physical examination. The nurses who qualify will become members of the regular corps during manoeuvres, and later will be carried on the reserve."

**MASSACHUSETTS FIELD HOSPITAL No. 2.**—In last week's issue of the JOURNAL we described the organization of the Second Massachusetts Field Hospital. On July 16 this hospital unit was mustered into Federal service as Field Hospital No. 51 of the United States Army, and will soon depart for the front. It is under command of Major (formerly Captain) Charles R. Morgan. Its other commissioned officers are Captain William M. Penny and Lieutenants Walter H. Young, Harold F. Parker and Robert F. Souther.

**RELIEF FUNDS.**—On July 22, the totals of the two principal relief funds for Massachusetts troops in Mexico, and their families, reached the following amounts:

Volunteer Aid Fund .....	\$71,847.44
Home Relief Fund .....	1,469.00



## BOSTON AND NEW ENGLAND.

**THE WEEK'S DEATH RATE IN BOSTON.**—During the week ending July 22, 1916, there were 189 deaths reported, with a rate of 12.96 per 1000 population, as compared with 198 and a rate of 13.79 for the corresponding week of last year. There were 37 deaths under 1 year, as compared with 30 last year, and 46 deaths over 60 years of age, against 54 last year.

During the week the number of cases of principal reportable diseases were: diphtheria, 47; scarlet fever, 15; measles, 136; whooping cough, 30; typhoid fever, 5; and pulmonary tuberculosis, 61.

Included in the above were the following cases of non-residents: diphtheria, 13; scarlet fever, 2, and tuberculosis, 3.

Total deaths from these diseases were: diphtheria, 1; measles, 1; typhoid fever, 1; tuberculosis, 14.

**ADAMS NERVINE ASYLUM.**—The thirty-ninth annual report of the managers of the Adams Nervine Asylum states that more patients were admitted in the past year than ever before. There were 259 men and women under treatment in that time. Of this number 11 were discharged as recovered, 117 relieved, and 72 not relieved. The amount received from patients was about 38% of the expenses. While more patients were admitted, the average stay was less than in former years. Those patients who seemed not suitable for treatment, or not suffering primarily from a nervous trouble, either went home or were recommended to some other hospital. More work than ever before was done in the men's department, and the sanatorium is making an effort to acquaint the medical profession of this State with the facilities here offered for men.

**CRUISE OF THE ANDROSCOGGIN.**—United States Coast Guard Cutter *Androscoggin* returned on July 11 to Port of Boston from her latest cruise on the Grand Banks as a hospital ship, having made the farthest north that she has ever sailed. Many cases of sickness and incidental trauma were treated aboard the *Androscoggin* during her voyage.

**HOSPITAL GIFT.**—Report from New London, Conn., states that on July 14 the Lawrence Hospital of that city received an unrestricted gift of \$25,000 from Mrs. Morton F. Plant. It is probable that it will be used either for a new building or for addition to the present one.

## Obituary.

## LOUIS AUGUSTUS WOODBURY, M.D.

DR. LOUIS AUGUSTUS WOODBURY, a descendant of John Woodbury, who came to America with the Massachusetts Colony in 1624, and a prominent practitioner of Groveland, Mass., died at his home in that town, July 18, 1916, at the age of 71 years. The son of Washington and Dolly Head (Jones) Woodbury, he was born in Salem, Oct. 1, 1844. His education was obtained in the public schools of Concord, N. H., and at the age of 18 he entered the Union Army as a member of D Company, 16th New Hampshire Volunteers, serving until the company was mustered out. Entering the Harvard Medical School, he was graduated with the class of 1871 and settled in Groveland, where he practised medicine for the rest of his life, retiring about five years ago. He became a Fellow of the Massachusetts Medical Society in 1873, his name being placed on the retired list in June of this year.

Dr. Woodbury was a member of the New Hampshire Association of Army Surgeons, the Harvard Medical Alumni Association, the Haverhill Medical Club, the New England Historic Genealogical Society, the Essex Institute, and the Society of the Sons of the American Revolution. He was a Knight Templar.

In 1869 he married Alice Chester Stanwood. She died in 1889, and he married, in 1890, Helen Ney Robinson. His widow survives him. His writings include "A Contribution to the Early History of Medicine in Haverhill," "Inscriptions from the Old Cemetery in Groveland," "Early Ministers of Bradford," and "An Historical Sketch of Bradford in the Revolution."

## Miscellany.

## COMMUNICABLE DISEASES.

The striking facts of the communicable disease situation for June, 1916, are the continued high mortality for measles and the low incidence of typhoid fever.

**Prevalence.**—The communicable diseases, prevalent in about the same amount as during June of last year, have continued to be above the five-year average for June. As was noted last month, this increase above the average for the five-year period is due to the unusual prevalence of measles.



## TOTAL CASES REPORTED.

	June, 1915.	June, 1916.	Average for 5 Years, 1910-1914.
Cases .....	7525	7500†	4880*
Case incidence per 100,000..	204	203	139
Deaths .....	457*	402*	— ‡

Measles continues to be the most important factor in the communicable disease reports. There is very little variation between the number of cases reported last year during June and this year.

## TOTAL CASES REPORTED.

	June, 1915.	June, 1916.	Average for 5 Years, 1910-1914.
Cases .....	4054	4186	2362
Case incidence per 100,000..	110	113	67.4
Deaths .....	18*	42*	25.8

The center of greatest prevalence of measles has shifted during the last month. There have been fewer cases reported from Springfield and Worcester, while there has been an increase in the cases from Lowell and Fitchburg.

During June the following cities and towns have exceeded their endemic index: (Endemic index signifies the average for five years of reported cases exclusive of epidemics. This index is applied to each city and town for each month for every communicable disease.)

	Endemic Index.	Current Month.
Middleboro .....	1	27
Belmont .....	2	26
Bridgewater .....	2	111
Chicopee .....	6	47
Dartmouth .....	1	18
Fitchburg .....	11	129
Gardner .....	2	107
Hardwick .....	0	30
Holyoke .....	15	117
Grafton .....	0	24
Mansfield .....	1	73
Middleboro .....	1	44
Lowell .....	83	345
Newton .....	67	101
Palmer .....	1	102
Rockland .....	0	71
Shirley .....	0	92
Springfield .....	37	154
Warren .....	0	35
Williamstown .....	2	43
Worcester .....	58	242
E. Longmeadow .....	0	24
Brockton .....	33	107

Scarlet Fever shows a marked decrease, both in comparison with last month and with June, 1915. It is somewhat lower than the five-year average for the month of June.

## TOTAL CASES REPORTED.

	June, 1915.	June, 1916.	Average for 5 Years, 1910-1914.
Cases .....	885	460	514
Case incidence per 100,000..	23.9	12.5	14.6
Deaths .....	18*	14*	16.1

\* Bulletin figures. † Figures not available. ‡ Approximately.

There was a sharp decline in the number of cases of scarlet fever reported during the month of June. In Peabody there were more than the average number of cases reported, and investigation of the district health officer shows that they were due to "missed cases." The local board of health made a house-to-house inspection and has the situation under close observation.

The following cities and towns have exceeded their scarlet-fever endemic index for the month of June:

	Endemic Index.	Current Month.
Norwood .....	2	7
Peabody .....	2	18
Mendon .....	0	7
No. Brookfield .....	0	4
Holyoke .....	8	24

Whooping Cough has shown a slight decrease in amount, as compared with June of last year:

## TOTAL CASES REPORTED.

	June, 1915.	June, 1916.	Average for 5 Years, 1910-1914.
Cases .....	608	537	216*
Case incidence per 100,000..	16.5	14.6	6.2
Deaths .....	29*	11*	16

This infection was distributed over the eastern part of the state, with practically no reported case coming from districts 7 and 8. The following cities and towns have exceeded their whooping cough endemic index:

	Endemic Index.	Current Month.
Barnstable .....	1	8
Braintree .....	3	15
Brockton .....	9	85
Cambridge .....	5	29
Clinton .....	0	15
Lexington .....	1	18
Winchester .....	1	17
Stoughton .....	0	9
Fall River .....	7	16

Diphtheria.—There were about the same number of cases reported during June, 1916, as there were during the same month, 1915. This is considerably above the average for the five-year period. It is also a slight increase over last month.

## TOTAL CASES REPORTED.

	June, 1915.	June, 1916.	Average for 5 Years, 1910-1914.
Cases .....	609	567	496*
Case incidence per 100,000..	16.5	16.2	14.1
Deaths .....	35*	26*	43

The reported cases are scattered all over the state. The only points of infection of importance are Salem, Lynn, Haverhill and Oxford.

The following cities and towns have exceeded their diphtheria endemic index for the month of June:

\* Bulletin figures.



	Endemic Index.	Current Month.
Somerset .....	0	6
Quincy .....	7	16
Wrentham .....	0	7
Salem .....	4	21
Lynn .....	12	21
Haverhill .....	5	19
Lawrence .....	4	14
Oxford .....	0	13
Fitchburg .....	4	12

**Tuberculosis.**—The number of cases reported to this department during June showed a decrease in number compared with the same month last year and with the five-year average for June. It would seem that, with the increased machinery that we have for the detection of this disease, we should be getting an increased number of reports:

## TOTAL CASES REPORTED.

	June, 1915.	June, 1916.	Average for 5 Years, 1910-1914.
Cases .....	709	628	647
Case incidence per 100,000..	19.2	17.1	18.3
Deaths .....	276*	246*	364.2

**Typhoid Fever.**—The low incidence of typhoid fever, noted in last month's report, continues. The number of cases reported during June is markedly lower than the same month last year and the average for the five-year period. Fall River is the only city or town that has reported above its average of this disease. Even here the increase is only a slight one:

## TOTAL CASES REPORTED.

	June, 1915.	June, 1916.	Average for 5 Years, 1910-1914.
Cases .....	103	69	129
Case incidence per 100,000..	2.8	1.9	3.7
Deaths .....	12*	5*	19.4

**Mortality.**—There were 402 deaths reported to this department during June. Of this number 246 were caused by pulmonary tuberculosis and 44 by other forms of tuberculosis. The most important other cause of death was measles, which claimed 42 persons. Diphtheria was responsible for 26 deaths while whooping cough accounted for 11. There were four deaths from pellagra, 6 from cerebrospinal meningitis, 2 from tetanus and 1 from anthrax. The 5 deaths from typhoid fever, with 69 reported cases, gives comparatively low rate.

## RARE DISEASES.

**Trachoma** was reported from Boston (3), Fitchburg (1) and Woburn (1).

**Cerebrospinal Meningitis** was reported from the following places: Boston (8), Worcester (1), Fall River (1), and Cambridge (1).

**Malaria** was reported from Wellesley (2), Boston (3), Worcester (1), Springfield (1), and Newton (4).

\* Bulletin figures.

**Pellagra** was reported from Peabody (1), Danvers (3), Boston (1), and Worcester (1).

**Septic Sore Throat** from Boston (3), and Fall River (1).

**Dog-bite** (reported to this department). (Those marked "+" the laboratory examination showed the brain of the dog to be positive for rabies and are being given the Pasteur treatment.)

Attleboro (1), Montague (1), Hudson (1), Lowell (1), Lawrence (3), and N. Attleboro (1).

**Actinomyces** was reported from Winchendon (1).

**Smallpox** was reported from Fitchburg (1).

**Bacillary Dysentery** was reported from Natick (1).

## EPIDEMICS.

The septic sore throat epidemic in Watertown subsided promptly and with the exclusion of the infected cow from the milk supply.

During the course of the month there have been five additional cases of anthrax reported to the department and distributed as follows:

Woburn (3), Winchester (1), Norwood (1). All of these individuals were handlers of hides; each one handled dried China hides at the time of infection. The preliminary report on the anthrax situation has been submitted separately.

## THE FLY PROBLEM.

Two types of disease are communicated by flies: certain blood infections may be distributed by the small biting fly of the stable; a greater menace to the health of a community are the diseases which are communicated through the contamination of food by the ordinary house fly. A recent report by the United States Public Health Service describes in detail the methods by which this is effected.

In attacking this problem the greatest progress can be made by preventing the breeding of flies. It is estimated that about 80% of house flies breed in horse manure. Breeding also occurs in privy vaults, garbage and other decomposed matter. In attempting to destroy the maggots of the house fly in manure, one must bear in mind the fact that the manure will be used for fertilizing purposes, and that the application of a strong bactericide prevents the necessary decomposition of the manure and may be directly injurious to the crops. The United States Department of Agriculture in Bulletin No. 245, issued July 20, 1915, recommended powdered hellebore as a larvicide to use in treating manure. Experiments did not reveal any injurious effects upon plants from the use of considerable quantities of this substance nor were ill effects discovered upon chickens coming in contact with the treated manure.



"Powdered hellebore should be mixed with water at the rate of one-half pound to 10 gallons and the solution thoroughly stirred and allowed to stand for several hours in a barrel or other container. In order to obtain the most satisfactory results, the manure should be sprinkled with the foregoing solution immediately on removal from the barn. The sprinkling may be done with a watering can or similar device, using 10 gallons to 8 bushels of manure, taking care that all of the hellebore comes in contact with the manure and paying particular attention to the outer edges of the pile. In estimating the amount of solution to be employed it may be assumed that two bushels of manure per horse is the daily output of the stable. This is a liberal estimate, and in many stables the daily output is much less."

The use of borax for this purpose is slightly less expensive but more dangerous to plants. The directions given for its use by the Department of Agriculture are as follows:

"Apply 0.62 pound borax or 0.75 pound calcined colemanite to every 10 cubic feet (eight bushels) of manure immediately on its removal from the barn. Apply the borax particularly around the outer edges of the pile with a flour sifter or any fine sieve, and sprinkle two or three gallons of water over the borax treated manure.

"The reason for applying the borax to the fresh manure immediately after its removal from the stable is that the flies lay their eggs on the fresh manure, and borax, when it comes in contact with the eggs, prevents their hatching. As the maggots congregate at the outer edges of the pile, most of the borax should be applied there. The treatment should be repeated with each addition of fresh manure, but when the manure is kept in closed boxes less frequent application will be sufficient. Where the calcined colemanite is available, it may be used at the rate of 0.75 pound per 10 cubic feet of manure, and is a cheaper means of killing the maggots. In addition to the application of borax to horse manure to kill fly larvae, it may be applied in the same proportion to other manures, as well as to refuse and garbage. Borax may also be applied to floors and crevices in barns, stables, markets, etc., as well as to the street sweepings, and water should be added as in the treatment of horse manure. After estimating the amount of material to be treated and weighing the necessary amount of borax, a measure may be used which will hold the proper amount, thus avoiding subsequent weighings.

"Figuring borax at five to six cents per pound in hundred pound lots, and powdered hellebore at eleven cents per pound in like amounts, and estimating the amount of manure produced by one horse per day at two bushels, these methods of treatment would cost about one cent per day per horse for borax and one and one-half cents per day for hellebore. The hellebore treatment,

however, is somewhat more effective, as it shows about 95% of larvicidal action as against 90% for borax. The efficiency of borax can be pushed up to about 98% by doubling the quantity used, but this would double the cost and increase the chance of injurious action on plants from the manure so treated."

## Correspondence.

### PREVALENCE OF TUBERCULOSIS IN MASSACHUSETTS.

Boston, July 20, 1916.

Mr. Editor: I note in your last issue, in the résumé of communicable diseases for May, 1916, that the looked-for increase in the number of reported cases of tuberculosis through the newly-established dispensaries is disappointing. While it is somewhat hard to explain this situation whereby the number of reported cases of tuberculosis has not increased despite the fact that a large number of new dispensaries have been opened, the situation is quite the reverse in regard to the applications on file at the office of the Trustees of Hospitals for Consumptives for our four state sanatoria. Ever since the opening of our newer sanatoria in 1910 up to the present time, during the summer months not only has the number of applications on our waiting list been a very small one, but in the case of women it has even dwindled to nothing, so that there have been vacant beds for women in some of our sanatoria. This year, despite the steady increase of beds in local tuberculosis hospitals, our waiting list is longer than ever before so that at the present time there are nearly 300 men, women and children waiting their turn for admission. It seems proper to let these facts be known in order to avoid giving the impression, which might possibly be gathered from the statement in your JOURNAL above referred to, that the medical profession are not active and wide awake to the necessity of seeking out the tuberculous and endeavoring to provide sanatorium treatment for them.

Very truly yours,

JOHN B. HAWES, 2d, M.D.,  
Secretary Trustees of Massachusetts  
Hospitals for Consumptives.

### APPOINTMENT.

Dr. Cecil Kent Drinker of the Johns Hopkins Medical School has been appointed instructor in physiology at the Harvard Medical School.

### RECENT DEATH

PROFESSOR EMIL METCHNIKOFF, the celebrated French bacteriologist, died of cardiac disease at the Pasteur Institute, Paris, on July 15. He was born at Kharkoff, Russia, on May 15, 1845, and was educated at the Universities of Giessen and Munich. From 1870 to 1882 he held the position of professor of zoology at the University of Odessa, but in the latter year resigned to pursue private research in the anatomy of invertebrates. In 1888 he became associated with Louis Pasteur at the Pasteur Institute, and in 1895 succeeded to the position of director which he continued to hold at the time of his death. In 1908 he shared the Nobel prize for medical research with Dr. Paul Ehrlich of Berlin. He was the author of numerous scientific works, among which may be noted "The Nature of Man," "Immunity in Infective Diseases," "Prolongation of Human Life" and "Opportunistic Essays."



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## Massachusetts Medical Society.

### MEETING OF THE SECTION OF MEDICINE, JUNE 6, 1916.

#### PAPERS ON DIABETES MELLITUS, WITH THE DISCUSSION.

#### RESULTS OBTAINED IN THE TREATMENT OF DIABETES MELLITUS.

MAY 1, 1915-MAY 1, 1916.

By ELLIOTT P. JOSLIN, M.D., BOSTON.

In a paper read one year ago at Washington the results obtained in a series of cases of diabetes, coming under my observation for the year ending May 1, 1915, were reported, and in a subsequent paper in New York last December I brought together the results of treatment of all the cases I had seen up to that time. The former paper contained a note of hopefulness so unusual for an article on diabetes and the latter gave such specific explanation of avoidable causes of death in diabetes that now, when periods of one year and of six months have intervened, it is pertinent to inquire whether these new hopes and explanations were justified.

The comparatively short interval of time which has elapsed is by no means a bar to a correct answer, for the course of diabetes in the past unfortunately has been short, and the prolongation of life by six months to one year

would signify the gain of 10 to 30% in the duration of the disease. For, speaking roughly, the average duration of life of 408 of my fatal cases has been five years, and that of 490 of my living cases has already reached six years.

During the year ending May 1, 1915, 211 cases of diabetes came under my observation, and of this number 31, or 15%, died; during the subsequent year 314 cases were seen, and so far as I am aware, 37, or 11.7%, have died. If, for the sake of accuracy, I omit 6 cases from this number of whom I have no positive information during the five months prior to May 1, the percentage mortality is 12%, which represents a decrease in mortality over the previous year of about 20%.

TABLE I.—A COMPARISON OF THE MORTALITY OF DIABETIC CASES IN TWO SUCCESSIVE YEARS.

Periods of Observation.	Total.	Traced.		Dead.	
		No.	Per Cent	No.	Per Cent
May 1, 1914, to May 1, 1915	211	211	31	14.7	
May 1, 1915, to May 1, 1916	314	308	37	12.0	

These figures are encouraging, but they become still more so when I add that a study of the 37 fatal cases seen this last year shows that death might have been deferred in about one-half of these if the methods of treatment now in general use had been adopted.

The statistics above given are personal statistics, and therefore it appeared of interest to examine those of the State of Massachusetts, and this has been accomplished, thanks to the hearty coöperation of the Board of Health. Obviously, such compilations are less accurate; indeed, frequently the duration of the disease is not given on the death certificate. However,



for the sake of comparison I have arranged these data along with my own by decades according to the age of the individual at the onset of the disease.

TABLE II.—DURATION OF FATAL CASES OF DIABETES IN MASSACHUSETTS FOR 1915 COMPARED WITH AUTHOR'S TOTAL FATAL CASES.

Decades.	MASSACHUSETTS.		JOSLIN.	
	No. of Cases.	Yrs. Duration.	No. of Cases.	Yrs. Duration.
0-10	17	0.79	33	2.39
11-20	22	1.77	50	2.62
21-30	25	1.21	41	5.28
31-40	41	4.16	55	6.82
41-50	59	5.36	83	6.87
51-60	77	4.82	108	6.46
61-70	86	3.83	56	5.47
71-80	34	2.01	16	5.06
81-90	6	1.11	1	6.83

It will be seen that the greatest difference in mortality between the statistics of the state and my own lies in the early decades. And a further startling difference, not obvious in this table, lies in the number of cases in each group who succumbed during the first year to the disease. This is best illustrated by another table, which is of special interest because it includes the data of the Massachusetts General Hospital for two different periods. In it I have also included statistics given by Naunyn for his own practice.

TABLE III.—THE FATALITY OF DIABETES MELLITUS DURING THE FIRST YEAR OF THE DISEASE.

Sources of Statistics.	Number of Cases.	Percentage of Total Fatal Cases During First Year.	
		Number of Cases.	Percentage.
Massachusetts 1915*.....	370	27.9	
Boston 1915†.....	117	27.3	
Massachusetts General Hospital			
1824-1898.....	47	67.5	
1898-1913.....	69	40.6	
Naunyn.....	66	30.0	
Joslin.....	408	16.9	

It may not be out of place to add that of 490 cases of diabetes on my list, 94% have already passed the first year of the disease,—the danger-zone of the diabetic.

In a study of the causes of death of 408 cases of my series, it was found that two out of every three (66%) died of coma, that 87% of all those who succumbed during the first year of the disease died of coma, and that this was the case in 100% of the fatal cases in children. Therefore, if the mortality of diabetes is to be reduced, our energies should be directed first toward the avoidance of coma, because the treatment of coma is so unsatisfactory; and, second, particular attention should be exercised in the management of cases of diabetes in the first year following the detection of the disease.

\* The total number of fatal cases of diabetes mellitus in Massachusetts for 1915 was 648, but of this number the duration is recorded as less than one day in two, and not recorded at all in 278, thus leaving only 370 available for statistics; only 367 were used in Table II, three cases with duration of 22, 29 and 51 years being omitted in first three decades.

† The total number of fatal cases of diabetes in Boston for 1915 was 191, but the duration is not recorded in 74, thus leaving 117 available for statistics.

Furthermore, all cases should be persistently followed up, and the good effects of treatment not be allowed to lapse by indifference or neglect.

#### FATAL CASES.

May 1, 1915, to May 1, 1916.

Cause of Death.	New Cases.	Case. Nos.	Old. Cases.	Case. Nos.
Coma (within 24 hrs.)...	3	(1004, 865, 831)		
Coma (broke treatment)	4	(927, 740, 901, 868)		
Coma (died within 24 hrs., suppression urine)	1	(1015)		
Coma .....	4	(906—not seen since diabetes developed; 909, 887, 937)	7	(723, 181, 269, 530, 363, 813, 733)
Cardiac .....	1	(929)	1	(848)
Cardio-renal .....	1	(859)		
Thyroid .....	1	(869)		
Gangrene .....	2	(900, 1010)		
Operation on prostate or bladder drained.....	3	(939, 1042, 1019)		
Tuberculosis .....	2	(861, 862)		
Cancer .....			1	(474)
Appendicitis .....			1	(753)
Carbuncle .....			1	(513)
Pneumonia .....			1	(527)
Angina pectoris .....			1	(355)
Unknown .....			2	(823, 582)
Total .....	22		15	

#### DEFINITION AND DETECTION OF ACIDOSIS IN DIABETES MELLITUS.

By ALBERT A. HORNOR, M.D. BOSTON.

[From the Clinic of Elliott P. Joslin, M.D.]

SINCE KUSSMAUL described the deep breathing and coma of diabetic patients approaching death, and acetone diacetic acid and B. oxybutyric acid were associated with this condition by Petters, Gerhardt, and Minkowski, and an increase of the elimination of ammonia was pointed out by Stadelman, this state has been termed by Naunyn one of acid poisoning or acidosis.

By observation of the patient, it is easy to note the drowsiness, exaggerated respiration, and dry skin, so characteristic of the diabetic about to die in coma. So seldom does a patient recover and so temporary are the few recoveries recorded that it is manifestly necessary for us to recognize precomatose conditions if we would save our patients.

Consider the demonstrable differences between the metabolism of a comatose diabetic and the metabolism of a healthy individual. Until recently these were limited to the changes demonstrable in the urine. Of late, however, changes in the blood and in the expired air have been recognized. The changes in the urine are



the excretion of glucose and increased quantities of diacetic and B. oxybutyric acid and ammonia. The changes in the blood are a reduced amount of carbon dioxide and an increased amount of acetone bodies; the change in the expired air consists in a reduced percentage of carbon dioxide. The reason for this will be discussed later.

Among diabetics who are exhibiting no undesirable condition, one finds the condition of the urine essentially normal; in other words, an absence of glycosuria and no increased excretion of acetoacetic acid, B. oxybutyric acid or ammonia. Prior to the development of acidosis by a diabetic, there will always be a recurrence of glycosuria. Further, in none of the cases on which this study is based has there been any evidence of extreme acidosis where the amount of glucose excreted in the urine was less than the amount of carbohydrate ingested in the corresponding twenty-four hours; in other words, no extreme acidosis in the presence of a positive carbohydrate balance.

After the occurrence of glycosuria, there may quickly follow an increased urinary excretion of acetone bodies. This can usually be detected qualitatively and roughly estimated quantitatively by the addition of a few drops of a strong solution of ferric chloride (the Gerhardt test for diacetic acid, familiar to you all). It happens in rare instances, however, that a patient presents all other symptoms of diabetic coma without showing any marked ferric chloride reaction in the urine. In such instances, the presence of abnormal quantities of acid bodies may be inferred by the demonstration of an increase in the urinary ammonia, a part of the urea nitrogen being converted to ammonia, so that the acetone bodies may be excreted as salts of ammonia. In acidosis, the urinary ammonia may rise from the normal, 0.75 gr. in twenty-four hours, to 7.5 gm. or even more in twenty-four hours. At the same time, there is a change in the ammonia-nitrogen ratio of 1:12 to 1:3, or in extreme cases even 1:2. Consequently, if a twenty-four hour amount of urine be not available, one may estimate the degree of acidosis by determining urinary ammonia and urinary nitrogen and their ratio in a single specimen of urine. This, of course, involves the apparatus and ability to determine urinary nitrogen. The ammonia-nitrogen ratio serves as an index of acidosis save when alkali, for example, sodium bicarbonate, is being administered, under which condition some of the acetone bodies may be excreted in combination with the alkali administered. The determination of urinary ammonia may be done satisfactorily either by the method of Folin<sup>1</sup> or that of Malfatti.<sup>2</sup> The simpler, though less accurate, method of Malfatti (as described in the more recent text-books on physiological chemistry) is probably better adapted to the use of the general practitioner than that of Folin, involving,

as it does, only the mixture of urine with potassium oxalate and a titration with formalin. Actual quantitation of acetone bodies in urine is best done by the Schaffer-Marriott method. This, however, requires more apparatus and time than is available, save in highly specialized laboratories.

As already stated, in acidosis there occurs a reduced percentage of carbon dioxide in the expired alveolar air, which is consequent to a reduced carbon dioxide tension in the blood. Before discussing this fact, however, it is probably best to say a few words about the mechanism through which it is affected. By the micro method for quantitating acetone bodies in blood, described by Marriott,<sup>3</sup> it has finally been shown that in certain, if not all, cases of diabetic coma, there is an increase in the quantity of acetone bodies in the blood. This, however, does not affect the reaction of the blood either by increasing acidity or, what would be the same thing, decreasing alkalinity, though all the acetone bodies are acid in character. The present conception of the wherefore of this fact is chiefly due to the work of Dr. Lawrence J. Henderson.<sup>4</sup> His studies have shown definitely that the relation of blood to neutrality is that of slight alkalinity, and varies only within extremely narrow limits, and is capable of accurate determination only by the use of electrochemical methods. The reaction of the blood is maintained by the large amount of weak acids and their salts in the blood,—carbon dioxide and sodium bicarbonate, monosodium phosphate and disodium phosphate, and somewhat by the amphoteric acids from proteins. Carbonates and phosphates possess, so far as is known, the highest power to preserve neutrality in solution. Under normal, as well as under abnormal, conditions this is quite essential, for acid substances are continuously being poured into the blood in the course of normal metabolic processes. The maintenance of neutrality of the blood is further facilitated by excretion of volatile acids through the lungs, chiefly in the form of carbonic acids and the excretion of non-volatile acids through the kidneys, chiefly in combination with ammonia and other bases. Under normal conditions, the amount and kinds of acid poured into the blood by metabolic processes are such that the amount of carbonic acid present in the blood is practically constant. The acetone bodies in the blood of diabetics may be and frequently are in such great quantities that in order to maintain its constant relation to neutrality the blood must lower the normal tension of other acids. This is done by lowering the tension of carbonic acid. To do this, more carbon dioxide must be excreted through the lungs, inasmuch as carbon dioxide is excreted from blood capillaries until, and only until, the carbon dioxide tension and alveolar air is the same as that of the blood, it is necessary to increase lung ventilation. This



has been shown to be regulated by the reaction of the blood. In other words, lung ventilation will keep carbon dioxide at a level necessary to maintain the normal reaction of the blood. It was reasoned, and later shown, that since carbon dioxide is excreted from blood into alveoli up to the point where the tension of carbon dioxide in alveoli equals the tension of carbon dioxide in blood, the estimation of carbon dioxide tension in expired alveolar air would furnish an estimate of the tension of carbon dioxide in blood and, consequently, an indirect estimate of quantity of acetone bodies in blood. Recently, Van Slyke, Stillman, and Cullen<sup>2</sup> of the Rockefeller Institute have devised a method of determining directly the carbon dioxide tension of the blood. Theirs is an admirable and accurate method and requires no cooperation on the part of the patient and, consequently, is suitable for use even in comatose patients. The method is easily learned, but requires considerable apparatus and more time than does the estimation of carbon dioxide tension in alveolar air, which has been found to run parallel, at least among diabetics.

For the determination of carbon dioxide in alveolar air many methods have been described. In 1914, Boothby and Peabody, after careful study of the various methods, recommended that of Plesch as modified by Higgins, the collection of sample being simple, but requiring considerable apparatus for analysis of gas collected. Quite recently Marriott<sup>6</sup> has described a method which is probably simpler than any other, when once the standard solutions have been prepared. The method employed in this work has been that described by Fridericia.<sup>7</sup> The method is simple, involves the use of inexpensive apparatus, which may be easily transported to the bedside, and the complete test requires less than fifteen minutes. The objection raised to this method is that it requires cooperation on the part of the patient. This is, of course, regrettable, but among diabetics who cannot cooperate, the clinical evidence of acidosis is so striking that an estimation of carbon dioxide tension would be desired only for academic reasons. On the other hand, observations made upon one comatose patient agreed with that obtained by direct determination of carbon dioxide tension in the blood.

The determination is made by collecting in a specially constructed U-shaped glass tube the last hundred cc. of a forced expiration after a normal inspiration, and then absorbing at room temperature the carbon dioxide in this 100 cc. of expired alveolar air with a strong alkali (20% potassium hydrate), thereby causing a partial vacuum, which is later replaced by water at room temperature and atmospheric pressure. (A detailed description of apparatus and method is appended.)

By a study of the carbon dioxide content of alveolar air it is found that normally the ten-

sion of carbon dioxide varies between 38 and 45 mm. of mercury. Among diabetics with slight acidosis, the carbon dioxide tension varies between 32 and 38 mm. of mercury; with moderate acidosis between 28 and 32 mm. of mercury; severe acidosis less than 25 mm. of mercury. Nineteen mm. of mercury is the lowest tension observed in a patient ultimately recovering from acidosis. Nine mm. of mercury is the lowest observed in this present study. That was in a comatose patient only a few hours ante mortem.

In an analysis of three hundred observations of carbon dioxide tension in alveolar air recently made upon cases from Dr. Joslin's Clinic, and reported by me at the Peter Bent Brigham Hospital, it was found that patients with carbon dioxide tension less than 25 mm. of mercury all had three grams or more urinary ammonia in twenty-four hours, and a negative carbohydrate balance. When the carbon dioxide tension varied between 25 and 33 mm. of mercury, urinary ammonia was between 3.7 gm. and 1.5 gm. in twenty-four hours, and in three-fourths of the cases the carbohydrate balance was positive. With carbon dioxide tension greater than 33 mm. of mercury, the urinary ammonia in twenty-four hours was less than 2 gm. The carbohydrate balance was usually positive and always so when the carbon dioxide tension was above 36 mm. of mercury. Ferric chloride reaction varies from negative to strongly positive at 36 mm. tension and also at 23 mm. tension, and, consequently, must be a very rough index of the degree of acidosis.

With the determination of the so-called alkali tolerance as an index of acidosis by the administration of sodium bicarbonate until the urine becomes alkaline, I have had no experience. This has been due chiefly to the fact that this study has been made entirely within the past year, and that now some of us are in doubt as to whether administration of alkali may not do harm. Consequently, it has not been deemed right to attempt a study of this sort from a purely analytical standpoint.

In conclusion, therefore, the acidosis of diabetes mellitus, aside from its clinical picture of exaggerated respiration, drowsiness and rapid pulse, may be defined as a condition in which the carbon dioxide tension in the blood and, consequently, in the alveolar air is reduced; the acetone bodies in the blood and urine are increased and associated with this is a rise in the excretion of ammonia; glycosuria is marked, and, saving exceptional cases, toward the end of prolonged coma, the carbohydrate balance is markedly negative. All these factors are important in determining the degree of acidosis, and, where time and facilities permit, should be ascertained. The detection of glycosuria, the demonstration of a positive ferric chloride reaction, and the determination of a diminution in the alveolar carbon dioxide tension are the procedures suitable for



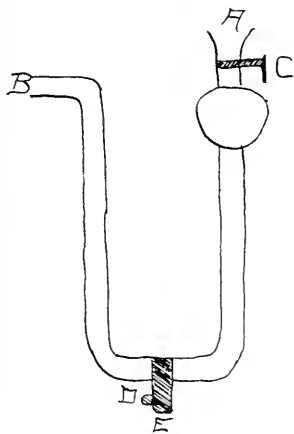
bedside use. The carbohydrate balance is also a valuable indication and one surely to be determined, but, unfortunately, it must always furnish information in part, at least, a day late.

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- <sup>6</sup> Marriott: Jour. Amer. Med. Assoc., 1916, Vol. lxvi, p. 1594.
- <sup>7</sup> Fridericia: Berlin. Klin. Wochenschr., 1914, p. 1268.

## APPENDIX.

*Fridericia Method.* This method possesses the advantage of being simple and involving the use of apparatus which may be easily transported to the bedside. One hundred cubic centimeters of alveolar air are collected in a closed chamber and then cooled from the temperature of the body to that of the room. The carbon dioxide in this air is then absorbed with a 20% aqueous solution of potassium hydrate, thereby creating a partial vacuum, which in turn is equalized with water. This water is then subjected to atmospheric pressure, when the amount of carbon dioxide replaced by water can be read in per-



centage of atmospheric air by reading the height in centimeters to which the column of water has risen in the closed 100 cc. chamber. This percentage may be changed to millimeters of mercury pressure by multiplying by the difference between barometric pressure at the time of the test, and this varies in Boston between 770 mm. and 750 mm., and the tension of aqueous vapor at 37.5° Centigrade, which is 48 mm. mercury. This will make a factor which lies between 718 and 702. As the reading of 760 is much the more common at sea level, for clinical purposes the factor 715 may be used satisfactorily. The

patient should be in the same position and quiet for ten minutes prior to the performance of the test.

After a normal inspiration, the end, A, of the apparatus is inserted between the lips, and the patient is instructed to expire forcibly through the apparatus, with cocks C and D open, so that there is a free passage from A to B. The tube remains in the mouth throughout the entire expiration and the cock C is then closed, thus retaining between cocks C and D the last 100 cc. of expired air. (As the exchange of air in the upper respiratory passage is 200 cc. and the exchange of air from the alveoli is 800 cc., it is plain that with any care at all a sample of alveolar and not upper respiratory air will be obtained.) The apparatus is now immersed in a glass tank of water at room temperature and allowed to remain there five minutes. The best way to obtain water at room temperature is simply to keep the glass tank in the room with the patient for several hours before the test, though with an ordinary thermometer one can easily adjust the temperature of the water to that of the room. At the end of five minutes about 10 cc. of 20% aqueous solution of potassium hydrate is poured into the apparatus through the orifice B. A little of this potassium hydrate will leak through the hole in cock D to chamber CD. Now cock D is turned to the left so that chamber CD is closed and chamber BD is also closed. The small amount of potassium hydrate in chamber CD is shaken in the chamber for a moment. Then with apparatus in upright position, cock D is turned so that there is a continuous passage from C and B, and the amount of potassium hydrate which will run into the chamber CD is allowed to do so. Now cock D is turned to the left until BDE is a continuous passage, and in this way potassium hydrate is allowed to escape into the water tank. Chamber CD still contains 2 or 3 cc. of potassium hydrate solution and should be thoroughly washed with this solution. Every point in the surface of chamber CD must be touched by the alkaline solution. This is accomplished by shaking very thoroughly the potassium hydrate in chamber CD. The apparatus is again immersed in the tank of water, cock D is turned to the left until water rises into CD through EDC, and the apparatus left in the water five minutes. At the end of this time, the apparatus is raised until the bottom of the meniscus of the water in chamber CD is level with the top of the water in the tank. Now cock D is turned to the right until water runs through EDB to the level of water in chamber CD, which is now closed. Then cock D is turned further to the right until CDB is a continuous chamber. The apparatus is then again immersed to the bottom of the glass tank and the water in the arm BD of the apparatus should be at the same level with the water in the chamber CD and continuous with it. If this is not so, then the amount of water in BD should be changed



until it reaches the height of the column of water in CD. The reading is now taken in centimeters of the height to which the column of water stands in CD, and this is so graduated as to represent the percentage of  $\text{CO}_2$  which was absorbed by alkali and replaced by water. This completes the test.

The apparatus is prepared for the next test by opening cock C so that A to B is a continuous passage. The fluid in the apparatus is allowed to escape. Orifice B is put under the faucet and cold water allowed to run through the apparatus, taking care to shake sufficiently at the time so that water touches all of the inside of the apparatus. Repeat. Then pour through orifice B about 10 cc. of 4% solution boric acid. Rinse the apparatus very thoroughly with the acid so that there shall be no alkali remaining adherent to its sides. Wash again with cold water. Leave the apparatus so that orifices A and B are down, thereby allowing any water in the apparatus to drain out.

From the above it will be seen that the apparatus necessary is, first, the Fridericia appliance, a glass tank, whose depth is equal to the length of the Fridericia apparatus, a wash bottle containing 20% solution of potassium hydrate and another wash bottle containing 4% solution of boric acid. It is convenient to add an indicator, such as alizarin, or litmus, to the alkaline and acid fluids.

#### OBSERVATIONS ON THE BLOOD SUGAR IN DIABETES MELLITUS.

By ORVILLE F. ROGERS, JR., M.D., BOSTON.

[From the Medical Services of the Massachusetts General Hospital.]

THE aim of this paper is to present some conclusions as to the value or necessity of determining the blood sugar in treating diabetes, either from a prognostic or therapeutic standpoint.

There have been in the past many methods for the estimation of blood sugar, but most of them have necessitated the use of such large quantities of blood that they were not practical for frequently repeated determinations, and therefore not suitable for clinical work. Another objection has been the complicated procedures involved, capable of being carried out only in a well equipped laboratory, and by a trained chemist. In the past few years there have been a number of methods brought forth which can be carried out on small samples of blood, notably the Bang micro-method,<sup>1</sup> in which the amount necessary is only a few drops, and the Lewis-Benedict method,<sup>2</sup> in which 2 cc. of blood are required. At the Massachusetts General Hospital we are using the Lewis-Benedict method\* with a modification described by Myers and Bailey.<sup>3</sup> There are several other modifications

in which only a few drops of blood are used, but the accuracy of these is rather doubtful.

The normal blood sugar varies between 0.06% and 0.11% according to the various authors. With the method that we use, the average is around 0.09% to 0.10%, and the high limit of normal about 0.11%. There are many factors that influence blood sugar besides diabetes. The sugar in the blood seems to be in a very labile state, and may be much influenced by a number of causes. Excitement, infections, the ingestion of food, and nephritis may all raise the blood sugar values above normal for a greater or smaller period of time, and to a greater or less degree. Lately the influence of damaged kidneys in raising the blood sugar in both normal and diabetic individuals has been emphasized more and more.

Diabetes is the most common cause of increased blood sugar and it also causes the highest values. Those rather rare cases of renal diabetes are the only ones in which there is not some elevation of the blood sugar while sugar is being excreted.

The blood sugar among those patients treated at the Massachusetts General Hospital who had diabetes but who had had no previous treatment, or whose treatment had not been efficient, that is, they were still excreting considerable sugar, was about 0.26% for an average, with variations from 0.76% to 0.16%. The highest value that was found (0.76%) was in a man in coma and the next highest was 0.36% in a very severe diabetic on the verge of coma. Values above 0.30% seem to be uncommon unless there is some difficulty on the part of the kidneys in accomplishing excretion.

On the other hand, the blood sugar determinations done on patients at the time they left the hospital, when they were sugar-free, and had been so generally for some days or weeks, showed variations from 0.07% to 0.18%, and averaged 0.12%. This is a decided drop in the blood sugar, but only six or seven of the values were actually within normal limits.

This brings up the question of the relation of glycaemia to glycosuria, and the permeability of the kidneys to sugar. The level of sugar in the blood does undoubtedly determine in a general way in normal or diabetic individuals, with normal kidneys, the presence or absence, or the amount, of glycosuria, but it is also true that the level which blood sugar must reach in order to cause a glycosuria of any given intensity varies greatly in different diabetics and in the same diabetic at different times. Recent work by Hamman and by Foster reported at Washington in May, 1916, seems to show that for normal individuals there is a fairly constant threshold for sugar excretion. However, for diabetics this threshold was more variable.

McLean,<sup>4</sup> Epstein,<sup>5</sup> and Myers and Bailey<sup>3</sup> have published papers tending to show a direct relationship between glycaemia and glycosuria, especially when there is no renal element, and

\* I wish to express my thanks to Dr. W. Denis and Miss Anna Minot, by whom almost all of the determinations have been done.



they have all emphasized the fact that where the kidneys are damaged, either by nephritis or in coma, this relationship is much disturbed and we may have freedom from glycosuria with a hyperglycaemia of considerable proportions, due to the raising of the threshold of sugar excretion. This, of course, can be determined only by estimations of the blood sugar, and it is in this type of case that we may get some information of practical value from the blood sugar determinations.

In persons in coma, excretion both of sugar and of acid bodies may be much interfered with, and in the severest cases the urine may not give a reaction for either of these substances, or the reactions may be very slight. The blood, on the other hand, may have very large amounts of these substances, and it is through blood examinations alone that a true picture of the condition may be arrived at. In other cases, when nephritis is present, the urinary excretion of sugar may be much diminished in proportion to the hyperglycaemia, and the latter may remain quite elevated after the glycosuria has ceased. Likewise in some diabetics with normal renal function, as measured by our usual tests, there is apparently a decreased permeability for sugar alone, giving rise to the same state of affairs.

The true influence of this persistent hyperglycaemia on the diabetic state is not definitely settled. If there is a sufficient excess of sugar circulating in the blood of a diabetic without nephritis to cause glycosuria, it is assumed that there is an overstrain on the pancreatic function, and that the latter will be thereby weakened. If nephritis is added to this, and the glycosuria thereby prevented, the hyperglycaemia persists as before. The question now is as to whether under these conditions the functional overstrain still continues to be placed upon the pancreas.

The answer from general grounds would appear to be "yes," but there are some things that argue against this. Allen,<sup>6</sup> by repeated injections of dextrose into a normal animal, sufficient to keep up a continuous glycosuria and hyperglycaemia for many months, was unable to produce diabetes; on the other hand, the animal's tolerance for dextrose became doubled, probably due to decreased permeability of the kidney for sugar. With animals, partially depancreatized, but not rendered diabetic, he was unable to produce true diabetes by means of these injections. The other argument against the evil effects of a persistent hyperglycaemia is based on clinical grounds, namely, that many patients who have had this condition while in the hospital have done very well in the out-patient department, though, to be sure, we do not know that their hyperglycaemia had not disappeared. In a great majority of the cases the treatment as carried out with the urinary sugar alone as a guide seems to be efficient in reducing the blood sugar to within a slight amount above normal, and the

blood sugar determinations are not necessary as a guide.

From a prognostic standpoint it is not possible to predict from a patient's initial blood sugar level how long it will take him to become sugar free. Two parallel cases, each with a blood sugar of 0.26% on a mixed diet, entered within a week of each other recently. One had 6%, and the other 5% sugar in the urine. One became sugar free after one and a half days of low diet, and the other required three days of low diet and three days of fasting to achieve the same result.

As to the height of tolerance as forecast by the blood sugar, there seems to be nothing more definite. The tolerance may be low when the initial blood sugar is low, or it may be high when the admission blood sugar is also very high. In the same way, the fact that the blood sugar reaches normal values after treatment does not necessarily mean that the case is mild, for there have been several cases treated in which the tolerance was quite low in spite of easy reduction of the blood sugar to normal. On the other hand, there have been cases with fairly high tolerance whose blood sugar showed a tendency to be quite elevated even after some weeks of treatment, and this without high blood pressure, albuminuria, low renal function (phthalein test), or casts. To be sure, most of the patients who showed this persistent hyperglycaemia had some evidence of renal trouble as revealed by one or more of the four criteria mentioned.

As has been pointed out before, we do not know definitely how much, if any, harm it does a patient to live with a continued hyperglycaemia, so until we do the value of blood sugar determinations as a prognostic aid seems doubtful. Even in cases without renal involvement there does not seem to be any definite correlation between either the initial or the final blood sugar and the tolerance, but in general the mild cases tend to sink to normal faster and more easily than the severe, though, as shown, there are many exceptions to the rule.

One point that should be borne in mind in relation to these determinations is that they must be done either with the patient fasting in the morning, or at least four or five hours after food, for the alimentary hyperglycaemia of diabetes is of considerable duration and extent.

Many writers have pointed out that blood sugar is in a very unstable state, and if only a single determination is done, a false picture of the condition may be obtained. It would undoubtedly be best to have daily determinations if one wished to follow the blood sugar accurately.

#### SUMMARY.

Diabetics have a higher blood sugar when they are excreting sugar in the urine than they do when the urine is rendered sugar-free.







Init.	May 31	50	2 yrs. +	6.22	89	0	Mixed	6.5	40	115-75	0	Negative.
Wh.	May 11				0	1	0	0.15				
	May 20			Tr.	0	42	0	0.19				
	May 25			0	0	1	20	0.09				
	May 30			0	0	9	21	0.10				
	Apr. 18	31	1.5 yrs.	2.9	104	0	100	0.36		130-85	S. P. T.	Rare hyaline cast.
	Apr. 20			5.3	71	0	100	0.35	6			
La.	Apr. 26			0	0	2	5	0.17				
	May 11			0	0	0	17	0.10				
	May 20			0	0	8	10	0.09				
	Apr. 25	70	5 yrs. +	0	0	2	20 ±	0.16	110	140-65	0	Negative.
	May 2			0	0	1	51	0.13				
	May 11			Tr.	Tr.	0	120	0.11				
Wc.	May 10	51	8 mos.	5.1	2	0	Mixed	0.26	100+	140-95	S. P. T.	Few hyaline and granular casts.
	May 17			0	0	6	21	0.08				
	May 29			0	0	18	50	0.10				
	May 3	50	1.5 yrs.	1.0	2	0	Mixed	0.28	2.5	125-70	V. S. T.	Few casts. Hyaline and granular casts.
	May 11			0	0	6	25	0.14	60	43	0	
	May 25			0	0	7	0	0.08				
Bl.	May 30			0	0	12	31	0.11				
	Mar. 3	30	2 yrs.	5.5	80/100	0	20 ±	0.17	10.5	15	0	Few hyaline casts.
	Mar. 13			0.16	3.7	0	0	0.11				
	Mar. 25			0.65	15.0	0	6	0.18				
	Apr. 20			0	0	9	11	0.12				
	Apr. 28	41	3 yrs.	Tr.	Tr.	0	7	0.22	0.5	100+	45	Negative. Many hyaline and granular casts.
Ph.	May 9			0	0	10	100	0.13		275-155	S. T.	
	May 11	40	7 yrs.	3.0	2	0	Mixed	0.15	6.5	200-120		
	May 25			0	0	5	20	0.15		110-90	S. P. T.	Many hyaline and granular casts.
	May 29			0	0	1	10	0.12				
	May 29			0	0	1	10	0.12		120-80		
	Feb. 12	18	2 yrs. +	2.8	11	0	50	0.76			V. S. T.	Many granular casts.

## EXPLANATORY NOTES.

Blood for sugar determinations was taken in the morning with the patient fasting, and precipitated promptly, except in two instances, when the samples were taken three to four hours after a light breakfast, as noted below.

Pipets are indicated as "mixed," either when the patient had not had a restricted diet, or when the restrictions had been lax, or not observed.

When the carbohydrate in the diets was not known definitely that fact is indicated by a "±" sign, or by giving the probable limits, as 80/100.

In some instances the maximum limit of tolerance was not determined, as the patient had to leave the hospital. This is indicated by a "+" after the figure given, which is the limit reached in the wards.

Many of the admission blood sugar determinations were done when we did not have the corresponding 2-hour urine, so the total output of sugar cannot be given.

The urinary sugar is determined by the Benedict Methods both qualitatively and quantitatively.

\* The sample was taken when the patient returned to the Out-Patient Department, and was about four hours p. c.

† A. C. (about three hours p. c.)

This patient left the hospital on Mar. 17 but returned to the Out-Patient Department on Mar. 24, with 4.5% sugar in the twenty-four hour specimen. He at once returned to the hospital and was treated. The single specimen of urine, Mar. 25, showed only 0.8% sugar, but his blood sugar on that date still showed the effects of his previous overeating.

\* P. c. 14 grams sugar in twelve hours. Afterwards was incontinent.



The threshold of sugar excretion varies in different diabetic individuals, and apparently in the same individual at different times.

Sometimes the blood sugar returns to normal under treatment, and this is generally in the milder cases, though there are some exceptions to the rule.

A persistently elevated blood sugar may be an indication of the greater severity of the disease, or it may occur in apparently mild cases, but generally associated in the latter instances with some renal impairment.

By keeping the carbohydrate intake well below the limit of tolerance, as shown by the appearance of glycosuria, it has been found that the blood sugar will almost, if not quite, sink to normal, and our experience leads to the belief that efficient treatment can be carried out in most instances using the urinary sugar alone as the therapeutic guide.

There are undoubtedly a certain number of severe cases with marked acidosis or nephritis in which the true picture of the condition is much illuminated by direct blood examinations, both for sugar and alkali reserve.

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#### DISCUSSION.

DR. HARRY W. GOODALL, Boston: Dr. Joslin emphasizes the importance of early treatment of diabetes. I feel very strongly that in the absence of any other diseased condition the duration of life must necessarily depend in a large measure upon the intelligent early treatment of the patient.

One is very much impressed by the importance of early treatment in studying the out-patient cases. For the past seven years I have taken charge of all the diabetes in one of the out-patient clinics, and during the last two or three years the present method of treatment has been followed out as carefully as it is possible for one to carry it out. The conditions in the out-patient clinic are not unlike the conditions that one meets with in private work, especially the general practitioner.

The improvement in the treatment is most striking. Up to within the last two or three years the treatment was more or less spasmodic. We had little control of the patient, and the results were not especially satisfactory. At the present time with a clinic of about sixty diabetes, the majority of whom represent the early cases, the patients are grouped together into a class, being treated as a class and treated

individually. All of the patients are under the control and direct treatment of the young woman who has been trained in the treatment of diabetes, and is not a medical person. She is under my own supervision. Out of the sixty patients there have been but two deaths, which I think were the result of dietetic errors. In both instances it seemed impossible to get the proper food for the patient. Of course it is only fair to say the most severe cases were sent to the hospital for treatment, and then after they had become sugar-free were sent back to the clinic, but during this period of two or three years all the patients have been able to carry on their daily activities. The greater part of the time they have been free from sugar, and there have been few, if any, recurrences.

One of the most interesting things has been the treatment of the male cases. It has been very difficult to get hold of the men. They will not give up their work to come to the clinic, and we have succeeded in getting the mothers or the wives, and they have come for directions and have carried out our instructions at home. Out of the sixty cases about ten patients have paid little or no attention to the treatment whatever. They would come spasmodically, as they did in the days of old, but the remaining forty-five or fifty have attended most diligently, and have tried in every way to carry out our treatment and suggestions.

I think the success of the clinic has depended entirely upon the young lady in charge. She has shown great patience. When sugar has returned she has taken pains to find out what caused the return of the sugar, whether it was the fault of the patient or fault in the preparation of the food or what-not, and instead of scolding the patient, has gone all over the subject again and has taken every possible pains for encouragement in the work.

Whenever questions have arisen or whenever new patients have come with diabetic complications, they are immediately taken to the class and demonstrated as a warning of what will happen to them if they don't follow instructions. Under this system we have had the most satisfactory results, and I am sure even more satisfactory to the patient than to the physician.

DR. WALTER R. BLOOR, Boston: Because of the practically universal belief that diabetes is a disorder of the carbohydrate metabolism, the fact that there is a disturbance of the fat metabolism at the same time has been rather lost sight of, although some of the important symptoms of diabetes—for example, acidosis—are due, without question, to the disturbance in the fat metabolism. One reason for the failure to take the fats into account is no doubt the fact that glycosuria is the symptom which is readily recognized and measured. There are plenty of methods for determining the sugar in the urine, while there has been no satisfactory



or simple method for determining the fat; also the sugar is excreted while the fat is not, or at least we don't know of any fat secretion. A number of conditions indicate a disorder of fat metabolism. Whether the primary disturbance is a disturbance of the fat metabolism or of the carbohydrate metabolism is still a question.

In many diabetics obesity is a beginning sign, that is, obesity precedes the glycosuria. From fifteen to forty-five per cent. of diabetics begin with obesity. Then there is the ever-present symptom, acidosis, which is almost certainly due to failure to burn the fats. And, third, there is the lipemia, that is, the milky appearance of the blood, due without doubt to finely suspended fat.

This lipemia was a very common symptom in the days of the protein-fat treatment for diabetes, and a great deal of stress has been put on its presence by certain physicians, particularly in Germany. Inasmuch as the first stages of fat metabolism are believed now to take place in the blood, I considered it a great opportunity when I was allowed to examine the fat in the blood of Dr. Joslin's cases of diabetes. I found in the main two things: In mild diabetes there is practically no change in the fat of the blood. In severe diabetes the blood fat may be increased to 100 or 150%. This increase in blood fat includes not only what we ordinarily call fat, that is, glycerides of the fatty acids, but also "lecithin" and cholesterol. It is quite remarkable, it seems to me, that the relations between these constituents are practically those of the normal conditions. They are all increased together, and the relationships between them are not changed. This would seem to me to indicate that the fat metabolism in these cases under this treatment is practically normal, although on a higher plane. Under normal conditions the fat metabolism proceeds with a relatively low concentration of these fat constituents. In severe diabetes it requires a much greater concentration to, so to speak, push the reaction to its completion.

The other point which I wish to mention is that in Dr. Joslin's patients there was no lipemia, that is, the blood plasma was in all cases perfectly clear. For this reason I am disposed to regard lipemia as due to a fault in feeding,—that in the cases where it appears too much fat is being given. One point of Dr. Joslin's treatment is the regulation of the fat early in the treatment, and I believe that the disappearance of the lipemia is due to this fact, and that if lipemia is present it means simply that the patient is getting too much fat. There is no question that the fat metabolism is disturbed in diabetes, and if the lipemia occurs it means simply that the patient is getting more fat than he can take care of, even if he is getting only ten grams a day.

DR. G. CARROLL SMITH, Boston: I would like to call attention to one or two things which I

think we are in duty bound to mention and might be neglected by somebody else if I didn't call attention to them. I feel, for one, and I know from personal contact with many of you gentlemen that we all feel greatly indebted to Dr. Joslin and his co-workers for the admirable work that they have been doing for a number of years to help clarify the subject of diabetes, and I know you will all be glad to hear, if you have not already read, that in very many of the American cities the Joslin system is now in vogue, and especially is this true in the city where very advanced medical work is being done, namely, Chicago. The work being done today in the Cook County Hospital is entirely based on Dr. Joslin's system, and careful records are made according to his suggestions and according to the papers which he has read heretofore describing clearly the manner of procedure.

One other point which I think we ought to bear in mind today is that Dr. Joslin is fairer in his consideration of statistics than has usually been customary with medical men. As a matter of fact many of these cases that enter into his statistics are comatose when he first sees them, and of course we all know that such cases should not enter a table of statistics from any rational standpoint. There are other factors besides acidosis that come into consideration in a discussion of the cure of diabetes, because many diabetics die of other complications fundamental to the diabetes itself. The final acidosis undoubtedly is due to the faulty metabolism of fat in most cases, but it may be also in many cases due to defective circulation, as seen in cardio-renal disease. Such cases seem fairly to belong under the head of symptomatic, rather than idiopathic diabetes in the compilation of Dr. Joslin's statistics. Therefore, the high mortality of the same need not be discouraging.

A MEMBER: I would like to ask a question of Dr. Joslin,—how he knows when he has a case of diabetes how long the duration of the disease is; whether he considers the statistics throughout the state of any real value, when most of us have to guess at the duration of the disease when we make out the death certificate.

THE CHAIRMAN: I hope Dr. Joslin may be able to reply to that question. That is the only question I wanted to put to him,—when they speak of a case of diabetes of one year's duration, or six months', how have we any idea what the duration has been before the patient comes to us?

A MEMBER: I would like to ask Dr. Joslin if he can tell us what he does by way of treatment, or how he manages the diet.

THE CHAIRMAN: I would say in defence of Dr. Joslin that we didn't ask him to go into the question of treatment, as that would be a long subject. He has picked out just a little special



point in the treatment of a large number of cases.

THE CHAIRMAN: As we are not to have the pleasure of hearing from Dr. Janeway, I would like to give you a very few statistics taken from an article published by Dr. Janeway, these statistics being taken from a large number of life insurance companies. Life insurance companies, of course, look upon life merely as a matter of dollars and cents. The statistics are really quite interesting. The average blood pressure in nearly three thousand cases between thirty and forty was 123 to 128; between forty-five and sixty it was 128 to 134. Now, in 2600 cases accepted with a blood-pressure of 142 the average mortality was that of all cases. Of 525 accepted with a blood-pressure of 152 the mortality was 30% up. Of 1970 rejected, with a blood-pressure over 160, the mortality was almost double. I acknowledge that these figures were perfectly startling to me, but such they are quoted from a large life insurance company of New York.

DR. JOSLIN (closing the discussion): A question has been raised, Mr. Chairman, about the treatment. I will just pass around some of these cards to show the methods that several of us have adopted here. In the second place, about the statistics, that is an excellent point that was raised. I shall be very glad to answer it. For example, the total number of fatal cases of diabetes mellitus in Massachusetts for 1915, for which you gentlemen signed death certificates, was 648; but unfortunately the gentlemen here and elsewhere in the State did not record the duration of the disease in 278 cases at all, and in two cases recorded it as less than 24 hours, so only 350 to 370 cases were available for statistics, even a still smaller number than that as shown by the footnote I have used. Any statement about statistics of the duration of diabetes would be open to serious question. It is very difficult to say. In Boston, for instance, I think nearly one-half of all the cases that are recorded of deaths from diabetes had to be thrown out in making up the statistics because no duration whatever was put down. It is an important thing to endeavor to find out what the duration is, because that gives us some idea to go by as to treatment. As to the onset of a case of diabetes, sometimes you can tell, sometimes you can't. In a considerable number of cases it comes on acutely. For instance, out of my list some eighty odd cases were discovered by life insurance. On the other hand, in a good number of the cases the history showed the absence of sugar in the urine quite a long time before the disease was discovered.

A word about mortality. It really is the fact, as Dr. Smith pointed out, that a large number of cases that die are severe when one first sees them. Of course I see a great many cases of that kind for the first time. This last year one died of cancer, two of gangrene, one of appendi-

citis. To Dr. Bloor we are specially indebted for his painstaking work about the fat. I think few of us realize that a painstaking analysis takes about three hours, and that the fat is an extremely important matter, in fact the key to the situation of acid-poisoning today; and we are very fortunate here to have Dr. Bloor, who stands perhaps first in the world in the work along this line, investigate this problem.

To the other gentlemen, too, I am sure you, with me, are much indebted for their painstaking research work. It takes a great deal of time to carry through these blood analyses. They are easy to describe, but it is hard work, and what comes from hard work counts in the end.

A MEMBER: How does age affect the mortality?

DR. JOSLIN: All these data about mortality I have written up in extensive form, and I have really gone into it in great detail. For instance, all the cases have been classified according to the mortality, according to the onset of the disease. For example, in 1050 cases they are classified by mortality, and then one group taken up after another in really very great detail.

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## PAPERS ON NEPHRITIS, WITH THE DISCUSSION.

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### TESTS OF RENAL FUNCTION FROM THE STAND-POINT OF THE GENERAL PRACTITIONER.

BY FRANCIS W. PEABODY, M.D., BOSTON.

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DURING the past five years the attention of a large group of research workers in clinical medicine has been devoted to the development of tests of the functional capacity of the kidneys. Many methods have been devised, and exhaustive studies, both experimental and clinical, have been carried out to determine the comparative value and significance of the various tests. There has resulted a mass of new and important information which forms a landmark in the progress of scientific medicine, and which throws much light on the pathological physiology of nephritis. In a comparatively short period so much definite advance has been made that the time has now come when it is fair to take stock of our knowledge and to attempt to determine wherein and how far it is of direct benefit to the practitioner of medicine. In so doing it will be well to consider first the general significance of renal function tests, and second, the relative value of the various methods which have been suggested.

It is important to appreciate that these tests



are intended to be indices of impaired function. They are in no sense primarily diagnostic measures, although in certain conditions they may assume a diagnostic significance. Until the efficiency of the kidneys is decreased to the extent that they are unable to perform their excretory functions in the normal manner, the tests give, for the most part, no evidence of renal disease, and, on account of the great "factor of safety" with which all the organs of the body are endowed, there may be a very considerable destruction of renal tissue without impairment of renal function. The early diagnosis of nephritis must continue to be based, as heretofore, chiefly on the clinical history, the physical examination, the blood pressure, and the general characteristics of the urine. It was hoped that those functional tests which consisted in determining the ability of the kidneys to excrete certain definite substances (urea, lactose, salt, water) might be of value in the differential diagnosis of various morphological types of kidney lesion, but, unfortunately, careful study of the post-mortem findings has failed to reveal a constant relationship between inability to handle the test substances and any specific anatomical renal condition.

Broadly speaking, the chief value of the renal function tests lies in the field of prognosis. They give an index of the severity of the case, provided that it is so advanced that there is already functional impairment as well as anatomical involvement of the kidneys. They may frequently give the first and only indication of a very serious condition which is masked by a physical examination showing nothing alarming, and a urine examination which is only slightly abnormal. They serve as guides as to the progress of the case from month to month, and thus incidentally aid in directing treatment. They are, moreover, often of the greatest practical value when they give no positive information beyond the fact that the functional capacity of the kidneys is normal. This permits the giving of a prognosis which is, temporarily, at least, favorable, and which is based more securely than it could be by any other means.

However, few laboratory tests in clinical medicine are absolutely specific, and even in considering the prognostic value of the methods for the determination of renal function there are certain exceptions which must be taken up. The group of cases in which the tests have proved themselves to be of the most practical value is that which consists of chronic nephritis associated with vascular hypertension and cardiac hypertrophy, the type of case usually classed as chronic interstitial nephritis, or arteriosclerotic kidney. This is, of course, the most common form of chronic nephritis in clinical practice. In that other group of cases, usually marked by great oedema, oliguria, absence of cardiac hypertrophy, low blood pressure and large amounts of albumin in the urine,—the type generally

referred to as chronic parenchymatous nephritis, the functional tests are of much less significance. Even in extremely late stages of the disease all of the functional tests may be normal, or atypical. It is perhaps fortunate from our present point of view, that it is exactly in this group of patients that the prognosis can often be made with considerable accuracy from the other findings in the case. It should, moreover, be mentioned that in even the group of hypertensive cases there are occasional instances in which it has been impossible to correlate the functional tests with the clinical condition. Such atypical findings have occurred with all the tests that have been extensively used. Sometimes they are the result of a single observation and may be due to faulty technique; sometimes they may be due to errors inherent in the method; at other times they may depend on temporary variations in renal function which are not, however, true indices of the condition of the kidney. In cases with cardiac failure, all the tests in which the urinary output is a factor are liable to give unsatisfactory results, and it is only after compensation has been restored that an accurate picture of the renal condition is obtained. The same is true of local conditions of the urinary tract which interfere with the excretion of urine,—such as renal calculus and prostatic hypertrophy. Finally, of course, these tests have but little bearing on the prognosis with regard to what may be considered the accidental complications of chronic nephritis,—such as cerebral hemorrhage and cardiac failure.

The number of methods that have been proposed for the determination of the functional capacity of the kidneys is large, but the majority of them can be easily classified into a few groups, depending on the general principles involved.

There is thus one type of test which depends upon the analysis of blood. Owing to the inability of the kidneys to excrete the normal products of metabolism at the usual rate, these substances may accumulate in the blood, and the amount to which they are found to have increased in the blood serves as a general index to the degree of disability of the kidneys. The substances which have been most thoroughly investigated are the total non-protein nitrogen, urea, creatinin, and uric acid. Practically speaking, the two former, non-protein nitrogen and urea, are the substances which have attracted special attention. It was recognized many years ago that these substances are increased in the blood in chronic nephritis, but exhaustive studies of the conditions determining the increase, its relation to the clinical picture, and the variations which may result under different influences have been possible only since the simplified and rapid methods of Folin and of Marshall have made possible the obtaining of accurate analyses with small amounts of blood. The practical value of the non-protein nitrogen or the urea in the blood as an index of renal func-



tion is often great, but recent investigations have brought to light certain conditions under which the results may be quite misleading.<sup>1</sup> Thus, for instance, the normal values are much more variable than was at first supposed to be the case, and many healthy persons on a moderately high protein diet will have a urea content of the blood, which, under other circumstances, might suggest a considerable degree of nephritis. On the other hand, the level of these substances in the blood of persons with chronic nephritis may be markedly affected by diet, and figures which are well within normal limits may be found in patients with severe kidney lesions, provided they have been for a period on a low protein diet. Variations in diet may thus cause changes in the blood analysis, which are wholly independent of the actual state of the renal function.

Since the demonstration by Widal of the close relationship between sodium chloride excretion and the production of edema, and of the association of chloride retention with chronic parenchymatous nephritis, much attention has been paid to salt retention as an index of renal function. Few definite facts, however, of clinical importance, have as yet resulted. It is at present generally held that the metabolism of sodium chloride is so complicated, and so readily influenced by factors which are not yet understood, that a great deal of study is necessary before salt determinations in either blood or urine will assume a practical significance in the determination of renal function.

Another group of methods consists of those in which definite amounts of various substances are fed to the patient, and the rate of their excretion determined by means of urinary analysis. Typical of these is the test in which nitrogen, in the form of urea, is added to the usual diet. By quantitating the nitrogen in the urine, it is possible to determine whether this added nitrogen is excreted by the kidneys, and whether or not it is excreted within the time limits that might be expected in a normal individual. The successful application of such tests involves having the patients on a constant standard diet for several days before and after the test is given, the collection of accurate twenty-four hour amounts of urine, and the careful analysis of the urine for nitrogen. The results obtained are hardly to be regarded as quantitative, but rather as gross indications of renal function. Moreover, the number of days required, and the necessarily strict control of diet and urine, make it almost impossible to carry out these tests except under the best hospital conditions.

Of greater practical value is the type of dietary test advocated by Hedinger and Schliyer,<sup>2</sup> and subsequently developed with various modifications by European and American workers. Only one day is needed for the completion of the test, although in some clinics this is preceded by two or three days spent in getting the

patient on a constant water balance. The diet is standardized, but it is liberal, consisting only of articles usual on a mixed diet, including considerable amounts of meat, soup, tea and coffee. The essential feature of the test consists in determining the reaction of the kidneys to the diuretic substances contained in the latter articles. Specimens of urine are taken at regular times, which bear a definite relation to meals, and the volume, specific gravity, salt and nitrogen output are studied. The night urine is collected as a single specimen. Under normal conditions the variations in volume, concentration, salt and nitrogen excretion follow very definite curves. As the functional capacity of the kidneys becomes impaired, such changes are noted as the relative increase in the amount of night urine, lowering and fixation of the specific gravity, and decrease in the output of salt and nitrogen. The evidence which has so far been accumulated on this type of test indicates that these abnormalities of urinary excretion may occur quite early in the course of the disease,—even before the other tests show a decrease in renal function, and it seems probable that the use of this method may be of distinct service in the early diagnosis of chronic nephritis. The test involves, besides the administration of a simple standard diet, the accurate collection of specimens of urine, and chemical analyses which can be easily carried out in any laboratory. The interpretation of the results is not always simple, and as yet the number of published reports is scarcely sufficient to permit of broad generalizations as to its diagnostic and prognostic value, or its relative significance in comparison to other tests.

Another type of test for renal function consists in the comparison of the concentration of a given substance in the blood with the rate of its excretion in the urine. Ambard first showed that under normal conditions the rate of excretion of urea, or the amount excreted in a certain unit of time, depends on its concentration in the blood. The relation between the concentration in the blood and rate of excretion is known as the Ambard coefficient. In this country McLean,<sup>3</sup> at the Rockefeller Hospital, has devoted much attention to the development of the test. He expresses the relation of the rate of excretion of urea in the urine to the urea concentration in the blood by what he terms the Urea Index. Normally 100 or over, a drop in the Index signifies a lessening of the capacity of the kidneys to excrete urea. This method, which compares the amount of urea in the blood with that excreted in the urine in a unit of time is certainly much more reliable than are the methods which consist of blood analysis alone, for it has been shown that on the one hand high blood values may be associated with a normal rate of excretion, and on the other hand, normal blood values may be found when the Urea Index indicates a very low functional capacity of the



kidneys. Considered from a scientific point of view, the Urea Index probably gives the most reliable information concerning renal function. Its chief disadvantages, as far as they are known at present, are technical. In order that it shall be of any value, the Index must be based on extremely accurate chemical analyses of blood and urine. These can be carried out by well-trained technicians in hospitals and in private or commercial laboratories; but the sources of error are such as to put the test beyond the reach of the general practitioner.

The last type of renal function test to be considered is that which depends on the ability of the kidney to excrete some foreign substance. By far the most important method of this type is the now well-known phenolsulphonephthalein test of Rowntree and Geraghty.<sup>4</sup> This consists in the intramuscular injection of 1.0 cc. of a solution of the dye, and the determination of the percentage excreted in the urine during a period of two hours, by means of a simple, rapid colorimetric method. The test is so easy to perform that it can be used by any one, either in the office or the home, since no special technic is necessary, and no complicated apparatus is required. During the last few years the phthalein test has been tried out extensively in many clinics in this country and in Europe, and in general the results have proved extremely satisfactory. It has been shown by Thayer and Snowden<sup>5</sup> to give a satisfactory indication of the extent of the pathological lesion in the kidneys. Barring the conditions already discussed, in which any of the tests of renal function may fail to give satisfactory indices of the clinical condition, the phthalein test appears to be very reliable. Its value has recently received important confirmation in the comparative studies of McLean,<sup>6</sup> who has shown the phthalein output runs practically parallel to the Urea Index. The only serious divergence was found in patients with cardiac insufficiency, who were excreting very small amounts of water. These subjects excreted the phthalein more readily than they did the urea. The Urea Index is, moreover, according to McLean, a more delicate indicator in that it draws a somewhat sharper line of demarcation between normal and abnormal cases, while in the very severe cases, slight variations in the Index are of more significance than are corresponding variations in the phthalein output.

In reviewing the tests that have been advocated for the determination of the functional capacity of the kidneys from the point of view of the general practitioner of medicine, several criteria must be applied. In order that a test may be widely used it must not be time-consuming, it must not involve highly specialized technic or costly apparatus, and it must give sufficiently accurate information to warrant its application. The tests depending wholly or in part on blood analyses are too complicated to

come into general use outside of hospitals. The dietary tests require at least twenty-four hours and involve some chemical analyses, but they are quite within the field of most medical men. They are only very roughly quantitative, but they will probably prove to be of aid in the early diagnosis of renal lesions. Time and further experience will show whether they give information of value, which cannot be obtained in an even simpler manner. At present the phthalein test seems to stand out as being the most generally applicable of the methods. It has the disadvantage of depending on the excretion of a substance foreign to the body, but comparative studies have shown that the conditions governing its excretion are similar to those governing the excretion of urea. It is rapid; it is simple; it is, on the whole, very reliable. It is so easy a method of obtaining an accurate basis for prognosis in cases of nephritis, and it is so helpful as a guide to treatment, that it well merits the reputation it has achieved, and it should be even more widely applied than it has been hitherto.

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## EYE CHANGES IN RENAL DISEASES—THEIR DIAGNOSTIC AND PROGNOSTIC VALUE.

By PETER HUNTER THOMPSON, M.D., BOSTON.

THE object of this brief paper is to bring to your attention the findings, diagnostic value, and prognostic value of the eyes in renal conditions.

During the years 1827 and 1836, Bright called attention to the impairment of vision experienced by certain patients having renal disease. Ever since that time the eye symptoms have attracted more and more interest. As none of the characteristic changes occurring in the eyes can be seen with the unaided eye, it remained until the invention of the ophthalmoscope, in the year 1851, before the intracocular changes could be seen and studied. After that, in course of time, the findings in the eyes became so well understood that they have, for many years, been of real value in making the diagnosis and a great aid in giving the prognosis.

All physicians may be aware of these facts, but many do not take advantage of the valuable information gained by an ophthalmoscopic examination. One familiar with the use of the ophthalmoscope can make such an examination quickly and safely, and with little or no inconvenience to the patient.



It is a very common experience of every ophthalmologist to find, while doing routine office or out-patient work, changes in the eyes of patients which soon lead to a correct nephritic diagnosis, many of whom simply come complaining of the ordinary symptoms of eye-strain, or, at most, blurring of the vision, all of which they expect to have corrected by proper glasses. When told of the real cause of their symptoms, and advised to consult their regular physician for examination and treatment, and his examination of the patient, together with the urinalysis, confirms the ophthalmologist's suspicion, it all seems quite wonderful to those not familiar with this possibility. This very likely accounts, by hearing of these cases through relatives and friends, for so many patients asking during or after an ophthalmoscopic examination, if any signs of kidney disease were discovered in their eyes.

While physicians may practically always be able to make a diagnosis of renal conditions from the symptoms and general examination of the patient, together with the urinalysis, without the necessity of making an ophthalmoscopic examination, they cannot begin to give the prognosis with the same degree of certainty which would be possible for them if they were also sure that the typical eye changes were present. Even though the examination of the fundi should prove to be negative in a case known to have nephritis, this fact is also very helpful in giving a more accurate prognosis.

The value of an examination of the eyes, in this connection, may be over-estimated by some, and under-estimated by others, but I hope to give you a sufficient number of facts recorded by different observers, and obtained by personal experience through private practice and my services at the Massachusetts Charitable Eye and Ear Infirmary and the Boston City Hospital, to enable you, as medical men, to judge for yourselves.

The clinical changes observed in the eyes are confined chiefly to the retina, optic nerve, and choroid. Retinitis, or the so-called albuminuric retinitis, shows itself by loss of transparency, white spots or patches, exudate, and hemorrhages in the retina, associated with certain changes in its blood-vessels, and rarely by separation of the retina itself.

Loss of transparency of the retina is frequently very evident. When viewing the fundus, the normal retina, being transparent, is not seen, excepting its blood-vessels, as we simply see the red reflex of the choroid showing through, but when it becomes inflamed, it sometimes takes on a more or less general cloudy appearance, resulting from infiltration and edema, obscuring, in proportion to its density, the normal red reflex beyond.

White spots or patches are the most characteristic and frequent changes observed in the retina. Wherever located, they render the

retina opaque at these points, presenting a very striking appearance as they are seen against the red background, grouped chiefly about the macula and optic disc. They vary much in size and shape, and often coalesce, particularly at the posterior portion of the fundus, and may even form, in this way, a complete opaque area surrounding the optic disc. We frequently see white glistening spots, drawn out into lines, radiating from the macula, but not involving it, arranged in the form of a star, and when present, they are very characteristic. This stellate figure is not always complete, being represented at times by only one, two, or three quadrants, or there may be simply an occasional white glistening dot in this vicinity.

Exudate is sometimes seen, but it varies greatly in appearance and amount in different cases and the various stages of the disease. It is usually more abundant in the neighborhood of the optic nerve, and frequently hides more or less completely the view of the retinal vessels and the outline of the disc. In many of the cases, there is no visible exudate.

Hemorrhages are usually present. They may be large or small, many or few in number. Sometimes they form lines along the course of the vessels, and occasionally they are represented only by mere dots. The hemorrhages may or may not have well defined borders and may be round or irregular, while others present a flame-like outline, depending upon the anatomical arrangement of the layer of the retina where the blood is confined.

Retinal vessels, the veins in particular, are usually more or less engorged and tortuous. The arteries generally show signs of arteriosclerosis. Thickening of their walls renders them less translucent, and sometimes they present a beaded appearance or have white lines or stripes along their course. Thickening of the walls of the arteries often compresses the veins when they happen to cross them, and thus impedes the venous flow.

Separation of the retina is quickly detected, when present, as the separated portion usually soon takes on a grayish appearance, hiding more or less completely, the normal red reflex. It projects forward, making it necessary to revolve a different lens before the sight-hole in the ophthalmoscope, in order to focus on its surface, so as to make it possible to see clearly the retinal vessels on the elevated area. This condition is quite often seen in the acute nephritis of pregnancy; otherwise it is rarely found.

The optic nerve usually shares sooner or later in the inflammation of the retina and occasionally shows the first signs of trouble in the eyes. The optic neuritis varies from a slight reddening of the optic disc, with some blurring of its borders, to marked swelling and exudate which completely obscures the outline of the disc, and it may even present the appearance of



choked disc. The usual picture observed in renal cases is a neuro-retinitis, both the retina and the optic nerve being involved, each sharing the same or one more than the other, in the inflammation.

The choroid is very likely more often involved, especially its blood-vessels, than we are able to make out with the ophthalmoscope, but we do see cases having well marked patches of choroiditis associated with the retinitis. The choroidal patches may finally become white centrally, from destruction of the choroid at this point, showing the white sclera, having dark pigmented borders, but they are readily distinguished from the white opaque patches due to the retinitis.

Associated with these changes, there is, sooner or later, impairment of vision. The amount of visual disturbance depends chiefly on the part of the eye involved. Slight changes in the macular region, or center of acute vision, will reduce the sight more than extensive changes in other parts of the fundus. On the other hand, cases showing quite extensive changes, away from the macular region, may retain good central vision for several months before it is finally reduced by involvement of this area.

While we do get other changes in the eyes in renal affections, those mentioned are the ones we rely on chiefly in making the diagnosis and, in nearly every case, it will be found to be correct. There is a great variation in these findings in different cases, and in the various stages of the same case. In some, the white spots or patches of the retina will be the prominent feature, in others, the retinal hemorrhages, and in others the optic neuritis. Both eyes are usually affected sooner or later, but the relative amount of involvement of each may vary greatly at different times.

Many of these renal cases present a picture so strikingly characteristic, when viewing the fundus, that the examiner is able, with but few exceptions, to make the diagnosis from this alone; but syphilis, brain tumor, certain forms of anemia and diabetes, especially the latter, occasionally show similar changes in the fundi, therefore it is wise also to have a careful examination of the urine in every case. However, when seeing such a picture we know at once that if it is not caused by nephritis it is due to some other equally serious disease. Even when the changes in the eyes are very slight, and not especially typical either, they often lead to a correct diagnosis by the ophthalmologist suggesting other examinations, with the view of finding the cause of the local disturbance.

The percentage of all renal cases, showing changes in the eyes, seems to vary considerably as given by different observers. Perhaps about twenty-five per cent. would be a fair average. Quite a number of people have the impression that every case of kidney disease will show signs of its presence in the eyes. Of course this

is not so. No doubt there are minute changes, particularly in the blood-vessels, long before they become sufficiently well marked, so as to enable us to distinguish them with the aid of the ophthalmoscope.

However valuable the findings in the eyes may be in making the diagnosis, it is the reference to the prognosis regarding the duration of life of patients having renal disease, in whom we also find characteristic changes in the eyes, that is of special importance, as it can be given with a far greater degree of accuracy than by the results of all other examinations combined. In making such a diagnosis, you are, in reality, rendering a death sentence upon the individual, which will probably take place within two years, even in those who are apparently enjoying good health at the time, and able to attend to their usual occupation. The duration of life, after the eyes become involved, is shorter in the poorer classes and longer in the better classes. It is usually longer in women and shorter in men in all classes. The prognosis is much more unfavorable when associated with chronic nephritis, than with the acute disease. The outlook is quite favorable, both in regard to life and vision in the acute form when the renal disturbance is entirely due to scarlet fever or pregnancy, especially in the latter, but if separation of the retina takes place, the vision may remain poor in the eye thus affected. Patients in whom we find an albuminuric retinitis, associated with chronic kidney disease, usually die within one or two years; rarely do they live longer than three, more often it is less than one year. Life has been prolonged occasionally for longer periods, when such patients have been able to provide favorable hygienic surroundings combined with proper diet and careful treatment. Under such conditions, the time has varied in exceptional cases, even up to twelve years.

A good deal has been said and written regarding the duration of life after the eyes become involved in these renal cases, by different writers and observers, and their figures and impressions naturally vary considerably because their work has brought them in contact with different classes of patients. Some have gathered their figures from private patients alone, others from hospital cases altogether, and others from hospital and private cases combined. Out of 155 private cases reported by Belts, 62% of them died inside of a year, 85% within two years, 14% lived longer, while out of 175 hospital cases, 85% died inside of a year, 93% died within two years, 6% lived longer. Bull reported 103 cases and 87% of these died within two years. Out of a series of 100 cases collected by Bell, from the private practice of different men, 73% died within one year, and 94% within two years. In a collection of 419 reported cases, Rogers found that 90% of them died inside of two years. Several other series of cases, some larger and some smaller, have



been reported by different men, but those given will serve to illustrate sufficiently the great aid in giving the prognosis in renal cases, regarding the duration of life, furnished by the additional knowledge of the presence of characteristic changes in the eyes, especially when we realize how uncertain it is in such cases when the eyes do not present these changes.

#### DISCUSSION.

DR. CHANNING FROTHINGHAM, JR., Boston: Mr. Chairman and members of the Society: After listening to these two very interesting papers, it is hard to do anything more than to simply reiterate what has already been so completely expressed.

There is one point on which I feel that I should like to criticize Dr. Peabody's paper. I fear, however, that probably none of you will agree with me. I think we ought to stop using the term, "chronic interstitial nephritis." It seems to me it is a rather vague term, although well grounded in the minds of the profession. If one looks at Dr. Mallory's excellent book on pathology, and sees how he has gone back to the original lesion in his classification of chronic kidney disease, it seems only reasonable to adopt his nomenclature, so that from the name, one may draw a mental picture of the disease from the outset. Chronic vascular nephritis is the name which should be applied to most of the cases of interstitial nephritis. At the present time, however, it is impossible by our methods of diagnosis to tell the difference between chronic vascular nephritis and the late stages of a chronic glomerulo-nephritis, although under the microscope the difference is readily seen.

Before emphasizing the points which Dr. Peabody has mentioned so well, I think the first thing for the practitioner of medicine to realize is that it is practically impossible with the means which we commonly use for making a diagnosis of nephritis to make an accurate prognosis. In other words, the examination of the urine for albumin and casts and estimation of the blood pressure only help us in making a diagnosis. The amount of albumin and casts in the urine is simply indicative of the amount of kidney destruction which is going on at that time. They are not indicative of how long that particular kidney is going to last. An increased blood pressure is probably indicative of a chronic nephritis. It is not indicative of the severity of the nephritis. Frequently we see cases as they reach their terminal stages and are becoming uræmic with the blood pressure considerably less than people who are apparently well and active.

The examination of the eye grounds may be of some prognostic as well as diagnostic value. For, although evidence of nephritis, when found in examination of the eye-grounds, as Dr. Thompson has pointed out, is a bad prognostic

sign, you must remember that a good many cases come to a fatal termination without evidence of changes in the eye-grounds, at least so far as they may be detected by those who are not expert in an examination of the fundi. Therefore, after making the diagnosis of nephritis, you either have to guess as to the length of life of the individual patient, or else you have to turn for aid to some of these functional tests which have been presented. Of the functional tests, I agree with Dr. Peabody, that the phthalein test at the present time is probably the most satisfactory for the general practitioner.

Let us remember that in the early stages of chronic nephritis, practically all of these renal function tests may be normal, and, therefore, that they are only of prognostic value as the nephritis becomes more advanced. In certain cases of nephritis, the phthalein test may be normal, and in certain cases of passive congestion without renal involvement it may be abnormal. It is, therefore, advisable to do more than one test for renal function, if possible, in each case. The other test which seems to me to be practical for the practitioner to make, is the examination of the blood for urea or total nitrogen. I do not mean that the practitioner will have to make the chemical analysis himself, but that he should simply draw the blood under the conditions which are recommended in these tests, and then send it to some laboratory equipped for making such examinations. In a given case of chronic nephritis, therefore, after making the diagnosis, you should turn to the functional tests. First estimate the ability of the kidney to eliminate phthalein. If that is normal, it is usually safe to assume that the nephritis is not far advanced, and further studies are not so necessary. If that is abnormal, however, before a definite prognosis is made, other tests should be done. Either the general practitioner can collect the blood and send it to a laboratory for a study of the urea or nitrogen, or he may avail himself of one of the various clinics which are now springing up throughout the country at which, in a few days, careful studies of the renal function may be made. This in no way should interfere with the relation between the practitioner and his patient, for it is understood that such patients are going to the hospital only for functional studies, and not for treatment.

There is one other point that might be mentioned here. All of our functional tests, or at least the great majority of them, at the present time, simply tell us how sick a nephritis case is. We hope, then, in the future, that functional or other tests will be devised which may be applied to mild cases of nephritis or to incipient cases, so that we may make an earlier diagnosis and institute more intelligent treatment in time to vary materially the course of the disease.



DR. GEORGE S. DERBY, BOSTON: Mr. Chairman and gentlemen: Dr. Thompson has covered this subject of the eye changes in nephritis so well, that all I can do is to add, perhaps, one or two points which, on account of lack of time, he was unable to put in. The first thing I want to call your attention to is the fact that albuminuric retinitis is not the only process which occurs in renal disease. We have also the so-called uraemic amaurosis, which is an entirely different proposition, due to uraemic poisoning, and which comes on as sudden blindness in from eight to twenty-four hours in the patient, accompanied by the other signs of uremia and often coma. This clears up in from twelve to twenty-four hours, the vision comes back to normal, and an examination during the time of blindness discloses absolutely nothing in the fundus whatever, because the process is situated back in the brain.

Now, the term albuminuric retinitis is a misnomer. It should be called renal or nephritic retinitis, because the albuminuria has nothing at all to do with it.

As Dr. Thompson said, twenty-five per cent. would be a fair estimate of the proportionate number of cases in which it occurs. Some estimates run below that. Probably if cases of this nature were followed until death occurred, we should find it in about one-third, thirty-three per cent. In the nephritis of pregnancy, it is rather less common.

Now, I feel that I differ a little bit from Dr. Thompson in what he said about recognizing these cases of albuminuric retinitis. It seems to me that the cases where you can say right out, "This is surely a case of renal disease," are in the minority. There are a great many cases where the appearance suggests it, but where it is not absolutely typical and you can only surmise it. In addition to that, there are a great many cases where the changes are extremely slight and you must have your other examinations made before you can say that the changes are due to a nephritis.

In a paper by Dr. Sloeum, of Ann Arbor, Michigan, which is going to be presented a week from today at Detroit, out of seventy-three cases of nephritis where the eyes were examined very carefully, only five were found in which the typical star figure of albuminuric retinitis was present—only five out of seventy-three, that is, about six per cent.

It is in the cases of interstitial nephritis where the diagnosis is more often made by the oculist first. The patient suddenly notices a blurring of vision, goes to the oculist, and a well developed retinitis is seen. I remember seeing such a case when I first started in practice. The patient, who was under treatment by a very good general practitioner for indefinite gastric symptoms, had not had her urine examined. She showed a well developed nephritic retinitis and was dead in two weeks' time.

Now, in all probability, according to the best opinion of the present day, the renal retinitis develops only if the disturbance in renal function has given rise to considerable changes in the arterial system, increased blood pressure and usually hypertrophy of the left ventricle. The disease is very rare under twelve, is common between thirty to sixty, most often seen between fifty to sixty; and except in the pregnancy cases it is seen very much more often in men. You see two cases in men to one in women. In a great majority of cases the disease appears in both eyes with a very short interval between, a few days or weeks. There are, however, some cases on record where the disease has remained entirely monocular, confined to one eye up to the time of death.

There are also changes appearing in the eyeground which cannot be classed as retinitis, and which appear much earlier in the disease. I refer to the vascular changes which are seen in the eyeground and which usually mean that there is a cardio-renal lesion. I think that in the recognition of these lesions the ophthalmologist can be of great use to the general practitioner. One needs a considerable amount of skill and perseverance to discover these lesions, and a certain amount of experience is absolutely necessary,—the sort of experience that one gets from the examination of cases in the general hospital, such as Dr. Thompson has in his examinations in the wards of the Boston City Hospital. For instance, I see a great many cases each year at the Massachusetts General Hospital where there are these slight changes, and those cases mostly are of cardio-renal disease,—cases where the prognosis is not so absolutely unfavorable as in those instances where you find a very definite retinitis. I think the ophthalmologist can do a great deal in the routine fundus examination of people as they come for glasses between the ages of forty and sixty, and can very often spot a lesion in the vessels and send the patient around to the general practitioner. Very often in that way quite a number of useful years can be added to the patient's life, by discovering the lesion earlier than it would be discovered otherwise.

#### REMARKS ON BLOOD-PRESSURE.

DR. G. V. N. DEARBORN, Cambridge: Mr. Chairman, and ladies and gentlemen: In the course of uncompleted observations on the relations of the mental process to blood-pressure (which has been my chief and particular form of research for two or three years), I came to a knowledge of the extremely wide variations in the blood-pressure,—both diastolic and systolic, and in both children and adults,—which I am sure is of practical application and of practical use to the average clinician. I have here about 140 graphs made from relatively continuous records of blood-pressure, each from two minutes up to about one hundred minutes in length



(one hour and three-quarters)—something, I think, which has not been done before. These are the originals, and I pass them around, for I would like to have you see what they are like; I am sorry that I cannot circulate them in some sort of regularity, or in order.

The best I can do, of course, in my brief allowance of time, is to suggest very summarily indeed some of the clinical conclusions which I think would be of the most practical interest to you. The first thing I want to point out is that there are always at least six or seven uncertainties in every blood-pressure determination. The first one (most commonly overlooked) is the *muscular tension of the arm*. The arm, of course, is actually not a fluid. Theoretically for blood-pressure tests it is a "perfect fluid," but in reality it is not so, and any increase in the tonus of the muscles certainly changes the blood-pressure. The second uncertainty is the *varying tension of the artery*, an element which has been sometimes overlooked. The artery, in order to be relatively incompressible, does not have to be sclerosed; it may be merely vasoconstricted. Of course you have a continually decreasing resistance to your decompression as the artery becomes less and less constricted. Third, is the *shape of a cross-section of the artery*. When it is a round tube it is obviously a series of arches, but as the artery collapses these become broken arches, and of course these are very weak as structural units. The fourth element that is to be taken into consideration is the *training-index* of the patient, whether the patient be a physically trained individual or not, and particularly whether he has had very recent exercise or not. A physician recently told me about a layman who went up in a high office building in New York City to have his blood-pressure measured and to take the remainder of a life-insurance examination. The elevator was not running and he walked up four or five flights of stairs in a hurry and excitedly. On the basis of his blood-pressure he was "rejected." The *excitement-index* of the patient necessarily comes into all these cases and is an important unknown factor until determined. The *mental activity* of the patient is a factor,—whether he is emotional or not, whether he is thinking or not, and so on. Then, occasionally I have found in the 4,800 measurements of blood-pressure which I have made in the last three years a distinct *dilatator spasm* (or *else atony*) of the artery, something which, so far as I know, has not been described, but which immediately "throws out," i.e., stops, all of the Korotkoff sounds which you have to hear in determining the arterial tension. The artery certainly "has a habit" under conditions to be determined, of suddenly expanding, and thus losing all the sounds. There is finally a *vasomotor neurosis*, not the "hypertonia vasorum idiopathica" that you find described in some of the text-books, but a distinct neurosis of

the immediate vasomotor apparatus which gives rise to long-continued high blood-pressures. For instance, a worried man of sixty-five had his pressure consistently up to 260 two or three years ago; he had no discoverable lesions in the kidneys or in any other organs whatever; he is now down to a reasonable blood-pressure for that age. I think we must be expecting soon the neurologic description of a vasomotor neurosis, one might almost call it a psychosis, which raises blood-pressure far above the danger sign, for example, in interstitial nephritis.

Now, there are certain practical and clinical deductions which I venture to make from these 140 "continuous" graphs which are in your hands. I have divided them into nine groups, and when the research-report is properly prepared they probably will be set forth in that manner. In Group A, there are those curves which show an enormous initial variation from day to day, sometimes as much as thirty millimeters with no apparent cause whatever except recrudite physiological conditions, which seldom have been taken into consideration. Group B shows a large and progressive fall from the first taking for 15 or 20 minutes. The average physician over the land does not realize, when he finds a patient's pressure a little higher than he thinks it ought to be, that perhaps 20 minutes later it may be 30 or 40 millimeters lower. One of these graphs shows 34 millimeters progressive physiological fall within 15 minutes in a normal individual under the quietest conditions.

Voluntary relaxation plotted in Group E is something I wish to call to your attention simply as a matter of expediency in insurance-examinations. A physician in a neighboring town voluntarily relaxed his muscles and in that way, as you see, reduced his blood-pressure, and then raised it by holding his breath, so that there was within 15 minutes a voluntary rise of 119 millimeters. First, he deliberately lowered his pressure (systolic) about 24 millimeters, and then he raised it to 230, a voluntary variation of 119 millimeters within 15 minutes, down and up. Anyone that understood the trick could do that in the course of a life-insurance examination, and no one the wiser, under present methods of using the gauge.

Normal variation is enormously large, as Group F shows. The most marked graph which I have had showed a wholly spontaneous variation up and down of approximately 40 millimeters within five minutes. This was a woman of about fifty-nine, a normal person, but a nervous woman with "a New England conscience," as Professor Putnam says, a woman whose autonomy is undoubtedly easily affected by emotional and intellectual stimuli.

Anesthetics (Group J) have characteristic blood-pressures. Mental defectives (Group H), the so-called feeble-minded, also have charac-



teristic blood-pressures, into the nature of which we cannot now go.

I wish to suggest that the diastolic pressure is only a little less variable than the systolic. One medical gentleman, again, said, "We never pay much attention to the blood-pressure of children anyhow." But my records, graphs, show that blood-pressure is almost as variable in adults as it is in children, and often more so.

I wish, then, to suggest as theoretic corollaries, that in the first place the physiologists should study vasomotion, and study it extensively. We must investigate the physics of the arm. We must understand the mental influences.

And then there are five practical corollaries: In the first place, *use twenty minutes instead of one in "taking a blood pressure,"* both diastolic and systolic; use twenty minutes instead of one, and take both the readings every minute, or at least every two minutes. I see one clinician smiling at that, but it is either that, ladies and gentlemen, or else a doubtful report; either fifteen or twenty minutes, or a misleading notion of that individual's real, effective blood-pressure. Second, *interpret no reading, save as the algebraic balance of two dozen or more factors and modifiers.* Third, *don't scare the patients,* unless you have some personal reason for taking too high a blood-pressure. Fourth, *the pressure in the brain and in the autonomic centers is more important than the pressure in the arm;* and we need a method of finding the pressure in these former places. And, fifth, there is probably a frequent neurosis, a well-defined "middle-age" vasomotor neurosis, which raises the blood-pressure without indicating anything of broad prognostic significance so far as we at present know.

DR. H. D. ARNOLD, Boston: The papers have been presented so ably that there is little room for discussion. I would like to say just a word, however, in reply to Dr. Frothingham's challenge,—that probably the rest of us wouldn't agree with him in abandoning the use of the term, "chronic interstitial nephritis."

It seems to me that perhaps it is better to "bear those ills we have than fly to others that we know not of," particularly as one of the really disappointing conditions in our present study of nephritis is the failure of the pathologist to correlate the pathological evidence with our clinical experience. Dr. Frothingham's suggestion of "chronic vascular nephritis" in place of "chronic interstitial nephritis" is valuable, I believe, for a considerable number of cases; but until we know the subject a little more thoroughly and know how far that term, "chronic vascular nephritis," would be a really proper term for our cases, I believe we should be no better off than we are with the present term,—recognizing that the present term is unsatisfactory.

A very interesting thing to me in studying

the cases clinically, which are ordinarily classed under the head of chronic interstitial nephritis, is to find a class of cases in which regulation of the diet seems to be followed by a very definite reduction in the blood-pressure. In these cases the natural interpretation seems to be that when you get the demand for elimination down to the capacity of the kidneys you have relieved a condition which is a factor in the high pressure.

Now, there is a class of cases in which the blood-pressure is only slightly, if at all, affected by dietary treatment; and it seems to me that in those cases at least the high pressure is very likely a compensatory measure. In some of these cases which I have studied by the functional tests, it has been shown that the vascular system is much more concerned in the process than are the renal elements proper. I believe we are going to recognize clinically, as we go on, different sub-divisions of what we now call chronic interstitial nephritis, and that one of these sub-divisions will be these cases where hypersensitiveness of the vascular system is a determining factor. I am wondering whether "chronic vascular nephritis" is not a term to be reserved for this sub-division, rather than to be applied to all cases which we now class as chronic interstitial nephritis.

### Original Articles.

#### THE PHYSIOLOGICAL POINT OF VIEW AND AUTOPSIES.

By FRANCIS H. McCrudden, M.D., BOSTON.

Laboratory Director, Robert B. Brigham Hospital.

THE usefulness of a point of view once established, the problem arises of extending its influence. At the Robert B. Brigham Hospital where we are demonstrating to physicians,<sup>1</sup> students,<sup>2</sup> patients, and others, the usefulness of the physiological point of view of the problem of treatment in chronic disease, it is evident that the patients appreciate its usefulness.<sup>3</sup>

From the large proportion of cases of death in which permission for autopsy is obtained, it has become evident that our ideas are spreading to the relatives of the patients.

Since the hospital opened on April 1, 1916, complete autopsies have been carried out on 70% of all those dying (35 autopsies in 50 deaths). The figure for 1914 is 74% (14 cases out of 19 deaths); that for 1916 so far (May 1) 100%. No other American hospital has attained results that at all approach these.

The figures which follow, taken from a report



in *The Modern Hospital*,\* show the best results in other American hospitals:

	PER CENT.
Robert Breck Brigham Hospital, Boston.....	70.0
Peter Bent Brigham Hospital, Boston.....	58.5
University of California Hospital, San Francisco	56.8
Presbyterian Hospital, New York.....	24.8
New York Hospital, New York.....	20.6
Boston City Hospital, Boston.....	14.7
St. Luke's Hospital, New York.....	14.4
Bellevue Hospital, New York.....	11.8
Mount Sinai Hospital, New York.....	7.3

(During one year Johns Hopkins Hospital performed autopsies in 62.5 per cent. of the deaths.)

An examination of the reasons for the difference in the figures would show, of course, that many factors are involved; but in the last analysis success depends on the degree to which the relatives can be made to appreciate what has been done to help the deceased, and the extent to which they can be made to understand that in giving permission for a post-mortem examination they may be contributing something toward helping other patients; the extent, in other words, to which they catch the hopeful spirit of our physiological point of view.

The figures bring out one other point, namely, that the emphasis laid on the physiological point of view need not lead to any neglect of pathological anatomy; in our hospital the direct result has been, on the contrary, an increase in the possibilities for pathological-anatomical studies.

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### Clinical Department.

#### CORSETS VERSUS BACKACHE AND FATIGUE.

By ALICE S. CUTLER, M.D., WESTBOROUGH, MASS.  
*Westborough State Hospital, Westborough, Mass.*

THE subject of corsets may not be an interesting one; but to me, as a woman physician (being on the staff of one of the large state hospitals) who has examined over a thousand women vaginally during the last five years, it has been instructive in showing me that the majority of women suffer from the ill effects of bad corseting.

I heartily agree with Dr. Robert L. Dickinson

\* Antepos Increased in Number, *The Modern Hospital*, p. 187, March, 1916.

of New York, who has made the following statement: "Many feminine ills are due to incorrect corseting and defective corsets."

For two years I have been experimenting with corsets, on patients, nurses, and my home friends. The idea was put into my head from pelvic conditions found in a physician's wife, who suffered from severe backaches and fatigue. (She had been advised by a number of physicians to have a ventral fixation.) A vaginal examination showed a retroversion of the uterus which was freely movable. While she was dressing, I observed the way she put on her corsets, and asked her to lie down on the examination table with them on—where before the uterus was freely movable, this time I could not lift it up without causing her great pain and discomfort. I advised her to buy a pair of front-laced corsets, which she did the next day. I showed her how to put them on lying down (with a pillow placed under the buttocks). I examined her again with these corsets on and found no displacement. She has made the statement a number of times that she never felt better; has no backaches, nor does she suffer with fatigue when she has to be on her feet a great deal. She plays tennis, dances, and does everything that a normal, healthy woman ought to be able to do, but cannot.

After my experience with the physician's wife I began working with women patients, nurses and employees. In over four hundred women, I found a backward displacement caused by the ordinary back-laced corset, put on incorrectly as most women fasten them together. With the nurses and employees who have changed from the back to the front-laced corset, there is complete satisfaction; they have all told me that at the end of their day's work they felt fresh enough to dance all night.

I know from my own personal experience that, since I began to wear front-laced corsets, I feel like a different person; where, a number of years ago, I was easily exhausted after working a few hours, now I do not know what fatigue is.

To cite a few cases:

CASE 1. Two young women in my home town (ages eighteen and twenty-one) thought they had to give up playing tennis, thinking the exercise too strenuous, because they suffered from severe backaches and pain in the lower part of the abdomen after this exercise. When they were fitted to front-laced corsets they both became enthusiastic, for they felt they could run all day without a symptom of a backache or abdominal pain.

CASE 2. Last summer one of our nurses wanted to enter a dancing contest, but was afraid she could not stand the physical strain, knowing that she easily "lost her wind." Front-laced corsets gave her confidence and allowed her to breathe in a normal manner. She and her partner won a prize.

CASE 3. A large, obese woman of fifty, with pendulous abdomen and breasts, while walking from



the gate to the main building (up a slight incline, a distance of two hundred feet) became dizzy. She came into the office and made the following statement to me, "I feel that something serious is going to happen." We went into the examining room. I took her systolic blood pressure and found it to be 186. Her face was scarlet, her feet and hands cold and clammy, heart action rapid and tumultuous. I helped her to undress; instead of unhooking the corset I cut the laces (in the back). The way the corsets were put on showed why she had marked dyspnea. I felt that her whole trouble was due to the corsets, and told her to buy a pair of front-laced corsets. In her case I had her put them on lying down, with hips elevated. This woman has been made so comfortable by being able to breathe and by not becoming dizzy when she walks, that she feels I have done her a great favor by demonstrating that the trouble was due to her corsets. Her blood pressure at the present time is 155.

I could cite cases indefinitely of the new lease of life given to women by wearing a properly fitted front-laced corset. I really hope this article will be the means of stirring up the medical profession to question their women patients about corsets; for women have made the complaint to me that their family doctors never ask them what kind of corsets they wear, and they are also surprised that corsets make such a difference in their own personal health.

### Society Reports.

#### CLINICAL CONFERENCE OF THE NEUROLOGICAL INSTITUTE, NEW YORK.

REGULAR MEETING, MARCH 14, 1916.

J. RAMSAY HUNT, M.D., in the Chair.

##### MYASTHENIA GRAVIS IN A CHILD OF EIGHT YEARS.

DR. J. W. STEPHENSON presented from the Second Division a girl 8 years of age, Hebrew. She is the youngest of three children, the others being in good health. It is said that her father's blood serum showed a four plus Wassermann. She was healthy until she was 9 months old, when she was vaccinated. Following this she is said to have developed blood poisoning. Her arm was swollen, she had a high fever, etc. Soon thereafter her mother noticed that the eyelids would occasionally droop, and then as the child began to walk it was noticed that she would tire easily. These two symptoms have persisted with remissions and are the two symptoms for which relief is sought. The mother's story is that the child wakes in the morning with eyes wide open, but after she has been about for two or three hours, the eyelids begin to droop and she complains of tiring, in fact has to sit down in order to become rested. She cannot walk more than three or four blocks without tiring.

Examination revealed a well-nourished girl, showing a double ptosis. There were no marks of degeneracy, no atrophies, no sensory disturbances. No evidence of persistent thymus. Blood pressure, 90. Pupillary reaction normal. Eye mobility in all directions upon first examination showed a decided

weakness, and upon repeated examination the patient was unable to perform any movements of the external muscles of the eyes. In other words, she showed a complete ophthalmoplegia externa. The child was allowed to rest in a recumbent posture, eyes closed, for a half hour, after which the ptosis disappeared, and eye movements, though not making a complete excursion, showed a definite amount of power. After putting the child through various tests for about five minutes, the phenomena mentioned above reappeared. There was no involvement of the muscles of deglutition or mastication. The knee jerks were lively, but upon frequent percussion became less active, but never entirely disappeared. The plantar responses were flexor and there was no alteration of the abdominal reflexes. Serological investigations of blood and spinal fluid were negative. The electrical reactions by Dr. Rochfort were as follows:

"The response of all the facial muscles is considerably reduced to faradism, particularly in the orbicularis oculi and occipito-frontalis. When these muscles are repeatedly stimulated, three times per second, the muscles soon show sign of fatigue. The response gradually becomes slower and less forcible, and finally after about 80-90 contractions disappear in the occipital portion. After a rest of two seconds the contraction is again about as vigorous as at the beginning. This phenomenon is doubtless a typical myasthenic reaction."

In concluding the presentation, Dr. Stephenson stated that the ophthalmoplegia externa with ptosis could be explained by the existence of poliomyelitis superior, bilateral disease of the quadrigeminal bodies, or myasthenia gravis; but the variable course of the disease, and the definite myasthenic reaction, proved conclusively that the patient was suffering from myasthenia gravis, the interesting features being age of onset, viz: first year of life; the four plus Wassermann in the father, and the fact that the condition followed a severe infection. The latter two conditions he considered, if followed up, might throw some light on the etiology of the disease, which as yet has to be fully explained. He also stated that, to his knowledge, the patient was the youngest case of myasthenia gravis on record.

##### A CASE OF BRACHIAL PLEXUS PARALYSIS.

DR. EDWIN G. ZABRISKIE presented from the First Division a girl of 17 years, single; occupation, a demonstrator of sheet music. Her family history is negative; both parents are living and well. She has two brothers and two sisters, all living and well. As far as can be determined, her infancy and her early childhood up to her seventh year were uneventful. At the age of seven she had an attack, which was characterized by swelling and pain in the arms and legs. She is uncertain whether it was confined to the joints or to the muscles. She was laid up in bed six weeks. She made, however, an uneventful recovery, but about six months later her left hand began to shake in the manner of a fine rhythmic tremor, which was somewhat increased by emotion. While rubbing the hand with a lotion, her mother noticed that the outer surface of the dorsum of the left hand was becoming thinner, and she says there was a marked tenderness and some pain along the last two interossei. About the same time she noticed that she was losing the power to extend fully the little and ring fingers of this hand, and that they were becoming slightly bent. After



a few months the pain and tenderness ceased, but she never regained the power to stretch out those two fingers, and the flattening of the hand at that point always persisted. She was always able to straighten them by using her other hand, and this process never caused any pain in the palm. When she was 13 years old she was shot in the right eye, and as a result of this she lost the sight completely in that eye; the right globe has also become fixed, and coincidentally she developed a paralysis of the left external rectus, which has also persisted. She at the age of 12 began to study music, and until a short time ago has been able to earn her own living at this occupation. About 1½ years ago, from no cause that can be ascertained, she developed pain in the left hand extending up the arm as far as the shoulder, which she described as a dull tearing pain something like a toothache. At the same time she began to notice a further atrophy of the entire hand, and it has gradually become weaker, more powerless, until at present she is unable to use it for anything requiring the least amount of power; for instance, she is unable to steady her meat with a fork, while she cuts it.

*Status præstans.* Delicately built young woman, whose physical state, except for the condition of her eyes and left arm, is normal. There is double abducens paralysis and right phthisis bulbi. The entire left arm is much smaller than the right and averages 3.5% less in circumference. The greatest amount of atrophy is in the thenar, hypothenar and interosseous muscles. All movements of the arm and forearm are possible, but the gross muscular power is greatly reduced. Flexion, extension, adduction and abduction of the hand are reduced to a minimum, and she is unable to perform these motions against the least resistance. Movements of the fingers are restricted to slight flexion of the thumb by means of the flexor longus pollicis; extension of the thumb by means of the long extensor. Flexion and extension of the little and ring fingers, adduction and abduction of all the fingers are abolished. Sensation is normal in the upper arm and radial distribution of the forearm and hand. The cutaneous distribution of the ulnar nerve shows a distinct hypæsthesia for all forms of sensation. For a distance of about 1½ inches above the wrist it is well marked, but above this joint it diminishes in intensity until it is quite indefinite at the elbow. The electrical responses are diminished but there is no qualitative alteration.

Radiograph of the neck reveals no abnormality of the bony structures, but on palpation, a small rounded mass can be felt just beneath the lower insertion of the left sternocleidomastoid. Pressure on this mass causes a shock-like pain referred to the inner aspect of the forearm and the little and ring fingers. Unfortunately, exploratory operation was refused, and it became, therefore, impossible to demonstrate this mass as the pathogenic factor.

#### PARALYSIS AGITANS WITHOUT RIGIDITY.

DR. J. RAMSAY HUNT presented from the Third Division a case of generalized tremor of the Paralysis Agitans type, unassociated with the muscular rigidity which usually accompanies this disease.

The patient was a man thirty years of age, of Irish extraction, a laborer by occupation. He was admitted to the Neurological Institute on February 1, 1916, and gave the following history.

There is no familial tendency to tremor or other nervous disease. He is moderate in the use of alcohol and tobacco. Eight years ago he acquired syphilis and received three years' continuous treatment with mercury by hypodermic injection, potassium iodide, and five full intravenous injections of salvarsan at intervals of three weeks. He states that coincident with the chancre there was a moderate jaundice, which was transitory in character. He has had no shock or injuries, and is unable to assign any cause for the tremor, which first made its appearance three and a half years ago in the right hand. It gradually progressed, involving the entire right upper extremity, and two years later appeared in the lower extremities. During the past year, when the tremor is severe there is also a difficulty in articulation. The left arm is also slightly involved, but in a much less degree. The tremor is slow, coarse and rhythmical, ranging from four to five vibrations a second. It is very much exaggerated by mental excitement and by observation. He states that on awakening in the morning he is comparatively free, at times totally free, from tremor. It makes its appearance after he is up two or three hours and lasts during the day, usually progressing as the day goes on. It is very coarse and violent when under excitement and if he tries to control it. While taking his history, he will often rise and pace up and down, and this relieves somewhat the tremor paroxysms. The tremor movement diminishes or ceases on intention, and he is able to lift a glass of water to the lips without spilling, and shaves himself every morning without difficulty, using an ordinary razor. It has also diminished and is very much ameliorated by the use of hyoscine. Since the onset of the tremor there is a marked tendency to hyperidrosis. He perspires very freely, and this manifestation is generalized, and not confined to any one extremity. There are no pains, no paraesthesias, and during his sleep all movements cease. The tremor is not relieved by taking alcohol.

A careful neurological examination reveals the following symptoms: There is infrequent winking, this reflex taking place only at long intervals of one, two and three minutes. The posture, manner of holding the arms and hands, the expression of the face, are very suggestive of Parkinson's disease. There is no well-defined Parkinsonian mask, but the face lacks a certain mobility of expression. The positions of the tremulous hands, however, especially the right, are quite typical. In walking, he holds the right arm stiffly and to a lesser extent the

James F. Innegan



left, and they do not partake in the natural associated movements which accompany this act. There is absolutely no rigidity of the muscles. The (cog-wheel) symptom, on making passive movements of the upper extremities, is suggested, but not characteristic of the Parkinson's disease. While there is no hypertonicity of the muscles, on the other hand there is no hypotonia, and the bodies of the muscles stand out quite firmly under the skin. There is no loss of power. The tendon reflexes of both the upper and lower extremities are normal and equal on the two sides. The pupils are equal and react to light and accommodation, and the cranial nerves are negative. The outline of the optic discs is clear and there is no evidence of neuritis. All of the skin reflexes, including the plantar, cremasteric, abdominal and sympathetic reflexes are present and normal. There is no disturbance of the objective sensibility. The visceral examination is negative, save for a left inguinal hernia. The speech shows a slightly tremulous character but is otherwise normal. Special senses are undisturbed. The urine is negative and the Wassermann examination of the blood and cerebrospinal fluid is also negative. There is no pleocytosis.

*Remarks.*—The case is regarded as an example of paralysis agitans without rigidity. This tremor form of Parkinson's disease is quite rare, and is by no means as common as the other incomplete type, namely, paralysis agitans without tremor. The diagnosis is based on the paralysis agitans type of the tremor; its cessation during rest, occurrence during activity; the synchronous, vibratory character of the tremor, which has the same rhythm in all the extremities. It can be inhibited by the will, but reappears in other parts of the body during the act of inhibition. Other additional signs indicating a Parkinson's disease are: the infrequent winking, the posture of the hands, the expression of the face, and the absence of associated movements of the arms in walking. It was thought that an *essential tremor* could be excluded because of the absence of the familial history, the unilateral onset in the right upper extremity and the Parkinsonian characteristics of the movements. The *chronic progressive cerebellar tremor* was also excluded because of the absence of any increase of the tremor movement on intention, as well as the absence of cerebellar elements, such as dysmetria, dysynergia, intermittent asthenia, and hypotonia which are associated with this disease.

Paralysis agitans may occur as a presenile or juvenile affection, and in a symptomatic form. It may appear without tremor (paralysis agitans *sine agitatione*), and, as in this case, it may appear without rigidity, this latter form being by far the rarest type of the affection. Similar cases have been described by Kurt Mendel, Oppenheim, and O. Foerster.

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### Book Review.

*Practical Physiological Chemistry.* A Book Designed for Use in Courses in Practical Physiological Chemistry in Schools of Medicine and of Science. By PHILIP B. HAWK, M.S., Ph.D.

Professor of Physiological Chemistry and Toxicology in the Jefferson Medical College of Philadelphia. Fifth edition, revised and enlarged. With two full-page plates of absorption spectra in colors, four additional full-page color plates and 172 figures, of which 12 are in colors. Philadelphia: P. Blakiston's Son and Company. 1916. Price, \$2.50 net.

The author presents us with the fifth edition of his well-known work on physiological chemistry, which is made to include all the newer tests, and, in fact, is absolutely up to date. It is profusely illustrated, and the micro-photographs of the rarer products, such as aspartic acid, glutamic acid, proline, etc., must be of great assistance for verification to the investigator who is isolating these substances. It contains both classifications of proteins, adopted by the American and the English scientific societies, which differ somewhat in their grouping.

All the directions given for the isolation of various products and their identification are very complete, and while to the trained chemist must seem somewhat superfluous, will naturally be of enormous assistance to students, for whom the book is primarily written. The chapter on nucleic acid and nucleoproteins contains all of the latest results of the various investigators who have been searching this previously little known field, and can be read with profit by clinicians who can naturally trace back uric acid to its origin. In the demonstration of the presence of uricase, no cautions are introduced against the overuse of potassium hydroxide, which, as is well known, will produce the same effects as the enzyme which is being studied.

That portion of the book which is devoted to gastric digestion and analysis is very complete, and the fractional method of removal of the gastric contents from the stomach, which has been so carefully investigated by the author and his students, has been given full attention. In the chapter on feces, as is usual, the greater amount of attention is given to microscopic examination and quantitative determination, employed not for clinical purposes, but for studies in metabolism. The chapter on blood analysis contains all the newer methods of quantitative determination of urea, uric acid, sugar and creatinin in the blood, which have so largely replaced the measurement of these elements in the urine. The chapter on urine leaves nothing to be desired in its completeness and the thoroughness with which all tests and their value are given. A well-arranged table of reagents needed in the various tests employed in the book is given at the close. On the whole, this work has not only maintained its previous reputation, but has added new laurels.



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## THE EPIDEMICS OF POLIOMYELITIS.

THE epidemics of poliomyelitis in New York and Massachusetts have continued to extend during the past week. On July 25 the total number of cases in New York City amounted to 3098, and the deaths to 647. In New York State, outside the city, there was on July 29, a total of 380 cases and 39 deaths. It is announced by the State Health Department that three new temporary laboratories are to be established to aid in combating the disease. At Poughkeepsie, N. Y., and in its suburb of Arlington, there had been, on July 25, 13 cases and five deaths, and it is believed that the reopening of Vassar College will be forbidden until the epidemic is at an end. At Oyster Bay, L. I., an investigation of sanitary conditions has been made by a local committee of citizens. Four cases have already occurred in this town. More rigid quarantine measures have been instituted in New York City, and no child

under 16 is now allowed to leave the city without medical inspection, a fortnight's quarantine and a health certificate issued by the federal authorities. In addition to the federal officials whose names were noted in last week's issue of the JOURNAL, as being in charge of the work in New York, the following surgeons of the United States Public Health Service were ordered to that city on July 21: Dr. W. J. Tettus, Dr. H. W. Witkes, Dr. D. E. Robinson, Dr. R. A. Herring, P. C. Kalloch, Dr. R. A. Kearney, and Dr. L. O. Weldon.

In Massachusetts the total number of cases on July 30 amounted to 95. Of these, there were eleven each in Westfield, North Adams, New Bedford and Worcester, and 9 in Boston. New foci of the disease have developed at Adams, Fitchburg, Barnstable, Hingham, Quincy, Revere and Taunton. The condition at Westfield is apparently the most serious, since the proportion of cases here to the total population is nearly as large as in New York City. Parents throughout the State have been warned by the Health Department not to take their children to either Westfield or North Adams.

In New England, outside of Massachusetts, there have now been in Connecticut, 118 cases, of which 19 were in New Haven, 12 in Bridgeport, and four in Derby. There have been three deaths from the disease in Bridgeport, two in Meriden, and one each at Windsor Locks and Milford. In Rhode Island there have been 25 cases, of which eight have been in Providence. On July 28 two cases were reported in Keene, N. H.

Outside New England, the largest focus of the disease is in Illinois, where on July 24 the total number of cases reached 73, with three deaths. Twenty of these cases were in Chicago. In Iowa there have been 14 cases and three deaths. From Elizabeth, N. J., was reported, on July 24, one of the first adult deaths from the bulbar type of the disease.

In the weekly report of the United States Public Health Service for July 14, 1916, was presented a complete tabulated statement of the prevalence of the disease throughout the country on that date, but these figures have since been so rapidly modified as to be of little present interest. In the same issue is an admirable summary by Dr. Wade H. Frost of what is known of the cause of the disease, the means of its transmission, and its epidemiological characteristics. Dr. Frost concludes that, on the



whole, the experimental evidence taken alone, while not excluding other means of transmission, points to the conclusion that poliomyelitis is a contagious disease spread from person to person through interchange of infectious secretions, the sources of infection being the clinically definite and clinically indefinite acute cases of poliomyelitis, convalescents, and passive human carriers.

In the weekly bulletin of the Health Department of the City of New York for July 8, is published a valuable statement describing atypical forms of anterior poliomyelitis and the use of lumbar puncture in their diagnosis. As a rule, poliomyelitis is regarded by the laity and by physicians alike as an acute disease, characterized by the early appearance of a more or less extensive flaccid paralysis. It has, however, widely varied manifestations. Wickman has classified the disease under eight types: 1, spinal poliomyelitis; 2, Landry's; 3, bulbar or pontine; 4, encephalitis; 5, ataxic; 6, polynuritis; 7, meningitis; 8, abortive. The simpler classification of Peabody, Draper and Dochez, from the Rockefeller Institute, recognizes three types: 1, abortive cases without paralysis; 2, cerebral cases with spastic paralysis; 3, bulbo-spinal cases. Wickman considers that from 25 to 56% of the cases are abortive. These cases are likely to escape recognition and are, therefore, most important in their relation to public health, from their likelihood of spreading infection. The symptomatology of this group of cases is further discussed in the *Bulletin* as follows:

"The initial symptoms are very like those of the paralytic cases: fever, hyperesthesia, drowsiness, headache, vomiting, varying degrees of stiffness of the neck, Kernig, positive Maeween. Seen during the first twenty-four or thirty-six hours, the diagnosis from epidemic meningitis can be made in no way except by lumbar puncture, and even this is sometimes confusing by the microscopic examination, as the fluid at this stage may be slightly turbid. The diagnosis from other acute infections of childhood depends to some extent on the greater degree of hyperesthesia and also on the examination of the spinal fluid, which in meningism, with other diseases, is normal. Recovery may take place in a few days. No diagnosis may be made unless expert consultation is obtained early. On the other hand, the symptoms may run on for two or three weeks. There often develop loss, diminution or inequality of the knee jerks and loss of the pupillary reflexes. At this stage the differential diagnosis from tuberculous menin-

gitis is very difficult, and lumbar puncture, while helpful, is by no means positive, the fluids in the two conditions being often very similar. In many cases there is a varying degree of weakness, often transient, and slight facial palsies are frequent. These abortive cases very evidently constitute the most dangerous foci for the dissemination of the disease.

"A very unusual manifestation of poliomyelitis is blindness. The Meningitis Division of the Department of Health has seen two such cases, one being in the present epidemic. In the first case, the vision was restored at the end of about three months. The second was a quite recent case and the blindness still persists. Cases with the bulbar type of paralysis, with difficulty in speaking and swallowing, are not uncommon in this epidemic and have, in some instances, been diagnosed as croup. In a fairly large number of cases, a rapidly ascending type of paralysis has been present, involving the muscles of respiration and ending with death. Some of these, when seen late, after pulmonary edema has developed, have been diagnosed as bronchopneumonia. The fatalities of the present epidemic have been largely due to these two types of the disease.

"The spinal fluid in poliomyelitis is usually clear and increased in amount. The albumen and globulin are increased in varying degrees, and there is usually a good reduction of Fehling's. The cellular increase ranges from slightly above normal to over 900 cells per cubic centimeter. Early in the disease the cells may be 50% or more polymorphonuclears. Later there are usually 90% or more mononuclears. There are frequently large mononuclear cells that seem somewhat characteristic of these fluids.

"Two rather unusual varieties of fluid are sometimes seen, probably the result of an extremely pronounced hemorrhagic condition. In one type the blood is evidently fresh, and is uniformly admixed with the spinal fluid, thereby differentiating it from blood obtained from the accidental puncture of a vein. Evidence of an older hemorrhage occurs in the second type, which presents a yellow fluid, coagulating spontaneously."

From July 5 to 8 a convention of Vermont health officers, held at Burlington, Vt., was devoted particularly to a discussion of poliomyelitis, upon which special research has been conducted at the University of Vermont College of Medicine. Papers were presented by Drs. Harold L. Amoss of the Rockefeller Institute and Robert W. Lovett of Boston. Since the epidemic of 1914, the disease has largely disappeared from Vermont, and in the effort to prevent its reintroduction, the State has established a rigid quarantine exclusion against per-



sions coming from New York City. Previous epidemics of poliomyelitis in the United States have been recorded; in Louisiana in 1841, and in other parts of the country in 1880, 1884, 1885, 1889, 1890, 1895, 1899, 1905, 1907, and 1912. Between 1905 and 1909 there were 8054 cases in the United States, representing five-sevenths of all the reported cases in the world during that quinquennium. In 1907, there were 2500 cases in New York, and in 1910, 1000 cases in the United States. The most serious previous epidemics in Massachusetts were in 1907 and 1912.

### CENTRAL CONTROL OF TUBERCULOSIS.

THE prevention of tuberculosis is so large a problem in preventive medicine that the considerations surrounding it can no longer be individual ones, but only central or communal. Public campaigns against tuberculosis have their chief value in guiding the public in their demands for the betterment of those conditions which are known to be such prolific causes of tuberculosis. Individual considerations and individual methods of care and prevention are factors in the general problem only in a comparatively small degree; and there can be very little feeling of security even in the knowledge that the lessons of prevention had been brought home to the conscientious individual. The carrying out of preventive measures by the individual depends for its efficacy upon the always variable and intangible will and comprehension of the points involved. Usually, however, those whom it is desired to reach most are quite out of reach because of general ignorance and low scale. For this reason every comprehensive investigation points to the community in its police capacity as the center from which changes must emanate if this problem is to be solved. Conditions must be so changed in the community that the personal factor will be a negligible element. The changes enforced must be in the industries—along sanitary lines, in better housing, in general cleanliness, raising of economic conditions, restriction of the drug and alcoholic consumption, central notification of all cases, better care of incipient cases and so forth. To be sure these measures require the individual coöperation, but the enforcement must be central.

In an exhaustive survey by Robinson and Wilson (*Public Health Bulletin, No. 73*) of conditions probably concerned in causing the unusually high incidence of tuberculosis in the city of Cincinnati, they found that in respect to the many industries located therein, there were no causes inherent in the occupations which helped in this increase, but that there were a great many deleterious factory influences, all remediable, to which this increase could be in part traced. Of the cases of tuberculosis found in the industries about 19.05 per cent. could be ascribed to one or another deleterious factory influence. These influences included insufficient space, insufficient toilet, washing, lighting and other facilities. The one prominent working element which seemed such a pertinent factor in the development of tuberculosis was the speeding up demanded in certain occupations. However, in 62 per cent. of the cases found in the industries there was a distinct hereditary factor, and about 19 per cent. of the cases were traceable to poor housing conditions. The hereditary element and the housing element are not distinctly separable, but overlap each other. A very large part of the apparently hereditary element is a housing one, in which the poor housing is the direct cause of the subsequent as well as the primary cases. The hereditary cases are really infections from the same source.

It is a significant fact that as much as 13 per cent. of the cases can be directly attributed to alcoholic excess; in spite of the still very popular belief that alcohol is curative, and not provocative of tuberculosis. Indeed, excesses of all kinds can be placed in this category. Abuse and excess, whether industrial or otherwise, as well as poor hygienic conditions, stand out prominently as causing tuberculosis in the individual and in the community. A community must make ample provisions for its growth and must curb abuses if it would maintain a high standard for health. It was found that in a city like Cincinnati where the growth of the city was rather slow, too slow to demand rapid and radical changes in its dwelling accommodations, as in a more rapidly growing city, and where as a result the excess population was accommodated in renovated but not enlarged building accommodations—where old buildings were made to accommodate more people than intended,—the rate of tuberculosis rose more rapidly than in cities where there was more congestion because of a more rapid growth.



## WELFARE WORK AMONG INDUSTRIAL CORPORATIONS.

THE August number of *The Modern Hospital* is published as a special issue, consisting of a symposium on welfare work among industrial corporations. The purpose of the issue is to provide valuable material for use by corporations in the way of first-aid study, emergency hospital, and welfare work.

The three phases into which welfare work is divided, or rather the three purposes for which it should be undertaken, are considered in this symposium to be as follows:

1. To make employees healthy, comfortable, and happy, in order that they may achieve the highest efficiency in their work.
2. To help employees prepare for the day when they are prevented from being bread winners, so that dependents on them may be provided for in case of sickness or disability.
3. To provide entertainment, recreation, and interesting groupings, in order that the employees of the corporation may have mutual interests which will enhance their loyalty and teamwork.

There are articles on various features of this work by Dr. Thomas Darlington, Dr. Samuel Lambert, Dr. S. S. Goldwater and many non-professional writers. In view of the prominence now being given to conditions of industrial welfare, this valuable special number of *The Modern Hospital* is particularly called to the attention of physicians.

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## MEDICAL NOTES.

LONDON DEATH RATES IN MAY.—Statistics recently published show that the total death rate in London in May, 1916, was only 12.9 per thousand inhabitants living. Among the several districts and boroughs, the highest rate was 18.6 in Finsbury, a crowded central slum, and the lowest was 8.5 in Stoke Newington, an open suburb on the north.

WELSH NATIONAL SCHOOL OF MEDICINE.—The foundation stone of the new buildings of the Welsh National School of Medicine at Cardiff was laid over a year ago by Lord Pontypridd. Sir William Thomas had given over £90,000 towards the completion of these buildings and over £250,000 more had been raised by Col. Vaughan. The war, however, has so far interfered with the project that further work on the buildings is indefinitely postponed. "This post-

ponement," says a recent issue of the *Lancet*, "is naturally a source of keen regret and must cause anxiety to all who have at heart the cause of medical education and who view with dismay the probable shortage of medical men in the near future."

PREVALENCE OF MALARIA, PELLAGRA, SMALL-POX, AND TYPHOID.—The weekly report of the United States Public Health Service for July 14, 1916, states that during the month of May, there were in Arkansas, 390 cases of malaria, 62 of pellagra, and 22 of typhoid fever. In Kansas during the same period there were 230 cases of smallpox, and 56 of typhoid.

AMERICAN DENTAL ASSOCIATION.—The twentieth annual meeting of the American Dental Association was held in Louisville, Ky., from July 24 to 27. At the second day's session, the subjects for special discussion were "the relation of mouth infections to general health and the importance of insuring prompt and permanent dental repair." Principal addresses were made by Dr. Thomas B. Hartzell of Minneapolis, Dr. John R. Callahan of Cincinnati and Dr. Weston A. Price of Cleveland. On July 27, Dr. L. L. Barber of Toledo was elected president, and Dr. Waldo L. Boardman of Boston a trustee for the ensuing year. The meeting of 1917 is to be held in New York City.

THE ASSOCIATED OUT-PATIENT CLINICS OF THE CITY OF NEW YORK.—The formation of an association of out-patient clinics of New York and Brooklyn about three years ago was recorded in the *JOURNAL* at that time with a statement of its aims which were:

1. The coördination of the work of existing dispensaries and out-patient clinics.
2. The elimination of unworthy applicants for treatment.
3. The promotion of proper standards of treatment.
4. The promotion of economy and efficiency in dispensary management.

On December 31, 1915, the membership of the Association numbered fifty-two clinics. The third annual report, for the year 1915, has recently been issued. The chief accomplishments stated therein are the establishment of two new sections of the Association, the Section of Surgical Clinics and the Section of Neurological Clinics. A statement of the required standard of a surgical clinic, prepared by that section, is given in detail and covers the equipment of a surgical clinic, the kind of patients to be treated in a surgical out-patient department, social service and visiting nursing and the history system. A similar standard has been drawn up by the Section of Neurological Clinics. Following a survey of the genito-urinary and syphilis clinics of Manhattan, additional suggestions were made to the already existing standard for clinics of that kind.



During the past year a chart, similar to the one published in the Second Annual Report, was prepared, showing the pathologic effects resulting from the inhalation of dust incident to a certain number of industries. The chart published last year in the annual report related to poisonous substances incident to industries in New York, but did not include dusts. The new chart was prepared by the executive secretary, and endorsed by Dr. W. Gilman Thompson, professor of medicine at Cornell University. The committee believes that the publication of this chart, in addition to the previous one, will be helpful to the clinics in the diagnosis of industrial diseases.

By the courtesy of the Division on Industrial Hygiene of the Department of Health, this chart will be published by the department, and the Association was requested to help the department in the distribution of this chart through the medium of the Annual Report.

#### EUROPEAN WAR NOTES.

**PRIZE FOR MECHANICAL HAND APPARATUS.**—A generous donor, who wishes to remain anonymous, has offered to the National Society of Surgery of Paris, a prize of 50,000 francs to be given to "the maker of the mechanical apparatus supplying the place of the hand best. All competitors must belong to allied or neutral nations. They are to present to the Society mutilated men who have been using their apparatus for at least six months. The Société de Chirurgie will experiment each apparatus on mutilated men for the length of time it thinks fit. The apparatus rewarded is to remain the property of its inventor. The competition will be closed two years after the end of the war."

MM. Faure, Kirmisson, Quénu, Rieffel and Rochard, who make up the committee elected by the Société de Chirurgie, inform the public of the condition of the competition as stated by the donor and beg any person wishing to compete to send his memoir and apparatus to M. le Secrétaire Général de la Société Nationale de Chirurgie, à Paris, 12, rue de Seine

**AMERICAN NURSES IN RUSSIA.**—The work of enrolled graduate American Red Cross nurses in Russia is the subject of a letter from Mr. William Warfield, formerly an attaché of the American Embassy in Petrograd, and now chargé d'affaires for the United States in Sofia, Bulgaria, addressed to Miss Jane A. Delano, Chairman of the National Committee on Red Cross Nursing Service. The letter follows:

"While acting as an attaché of the Embassy in Petrograd, specially assigned to war relief work, I had occasion, as you know, to see a great deal of the members of the American Red Cross units in Russia. It gives me great pleasure to take advantage of this opportunity to say that the nurses attached to these units have been the greatest credit to the organization, and to the

country they represent. Their professional efficiency is not only unquestioned but has excited a great deal of comment in medical circles, having been mentioned to me frequently by the Russian surgeons. Personally, by their devotion to duty and their splendid organization and discipline, these ladies have been a credit to American womanhood and its ideals. I do not hesitate to say that they have had an influence for good quite apart from mere professional services.

"I wish especially to express my appreciation of splendid work done by the group that worked largely under my personal supervision at Irkutsk. Their work there being non-professional in great part shows that the type of woman you are sending out is not only a good nurse but an all-round resourceful woman as well."

**WAR RELIEF FUNDS.**—On July 29 the totals of the principal New England relief funds for the European War reached the following amounts:

Belgian Fund .....	\$139,778.15
French Wounded Fund .....	105,609.07
Serbian Fund .....	101,609.07
Armenian Fund .....	100,115.00
French Orphanage Fund .....	57,775.03
Surgical Dressings Fund .....	41,205.87
Belgian Tobacco Fund .....	32,433.40
Faical Hospital Fund .....	23,765.51
Italian Fund .....	21,102.84
Permanent Blind Fund .....	3,305.13

#### MEXICAN NOTES.

**HOSPITAL NEEDS IN TEXAS.**—The American Red Cross headquarters in Washington on July 25 received very interesting reports from its special agent in El Paso, Texas, Dr. Eugene A. Crockett, of Boston. After stating that very little has been received at El Paso in the way of gifts and comforts for the soldiers he says that as far as their serious material needs are concerned very little is required. Dr. Crockett says:

"I have now seen quite thoroughly the camps in the vicinity of El Paso, both regular and militia; also the camps at Columbus, N. M., and on the line of communication south as far as Colonia Dublan, Mexico, where I spent two days, and from where I have just returned.

"There is no doubt in my mind but that the condition of the troops in general is excellent. The sanitation of the camps at Columbus, N. M., Ojo Fredrico, and Colonia Dublan is far superior to anything that I have ever seen, and I think about as near perfect as is possible to attain. The health of the troops is consequently excellent, very little serious sickness, and plenty of available beds in the hospitals, except here at Fort Bliss, where the immense number of volunteer troops has certainly crowded Col. Straub a



good deal. There is nowhere any lack of medical supplies or hospital necessities, and I don't think it necessary to ship any such things down here, nor, as I wrote Colonel Kean yesterday, can I see any possible use of civilian base hospitals of the Red Cross at the present time."

**MASSACHUSETTS AMBULANCE COMPANY No. 2.** In last week's issue of the JOURNAL we noted the organization of the Second Massachusetts Field Hospital. The Massachusetts Ambulance Company No. 2 has also been recruited to full strength to accompany this hospital and will also be mustered into Federal service. It consists of seventy-five non-commissioned officers and the following commissioned officers: Captain Oscar A. Dudley, Lieutenants James A. Lyon and N. M. Scott.

**WORK OF MASSACHUSETTS DENTAL UNIT.**—Since the mobilization of the Massachusetts militia, a dental unit under command of Dr. Theodore E. LaFayette has been at work among the soldiers who camped at Framingham, from July 1 to July 21. On the latter date this unit completed its services and made the following report to the Surgeon-General.

"To the Surgeon-General: Please find enclosed the information which you requested. In behalf of the dental unit I desire to thank you and the Medical Corps for the kind treatment extended to us at the muster field. A great many improvements could be made in our dental clinic—such as the lighting, sterilization and water supply, but owing to the prevailing uncertainty of time at the camp we tried to make the most of what we had. The work at the field has been of very great interest to us and if we have done nothing more than aid a few to enter or continue in the service of the United States Army we shall have felt our time well spent. Army life is fascinating and it is with regret that we feel our stay is nearly over—but look forward with the fond hope that some day we may be in the service as dental surgeons.

"At any rate we are all proud to have served our country in a dental unit which we feel is the first of her kind in the history of the American army. Whether in the service or in private life we shall always stand ready and eager to serve America in whatever capacity she may call us.

"Thanking those who have so kindly given us the opportunity to be of some service to our country and for the kind treatment at the muster field, I beg to remain,

"For the Dental Unit,

"Sincerely yours,

"(Signed) THEODORE E. LAFAYETTE, D.M.D."

TO THE SURGEON-GENERAL.

"Days on Duty—Twenty (July 1-21).

"Seven operators constantly on duty (visiting): Dr. Theodore E. LaFayette, Jr., Mr.

Harold W. Crowell, Dr. Stanley C. Keene, Dr. Angelo Lucibio, Dr. John Thomas, Dr. Roy Smith, Dr. Walter Kennedy.

"Chairs—Nine in good condition; one with broken legs.

"Gas Machine—One Teter machine ( $N_2OxO$ ).

Patients examined.....	3126
Cleaning .....	900
Cement .....	521
Silver .....	675
Extractions .....	1273
Gas $N_2OxO$ .....	219
Chloroform .....	2
Novocain .....	176

Treatments:

Pericementitis (loose bridge-work) ....	11
Alveolar abscess .....	37
Antrum infection (x-ray taken, case cleared) .....	1
Plates (partial) .....	37

Month lesions noted:

Lichen planus .....	2
Active pyorrhea .....	17

Material used:

48 bottles of white copper cement.	
24 bottles of white silver alloy.	
5 pounds of mercury.	
24 tubes of eocaine.	
50 "E" novocaine tablets.	
1 gallon sterile water.	
1 box temp. stopping.	
1 box C matrix.	
2 sets assorted burrs.	
11 large tanks of $N_2O$ .	
7 small tanks of oxygen.	
1 gallon of alcohol.	
2 quarts liquor antiseptic.	
50 corrosive sublimate tablets.	
11 pounds pumice.	
1 quart glycerin.	
48 clean white coats.	
15 bottles cleanoid solution.	
7 rolls of rubber dam."	

**MASSACHUSETTS RELIEF FUNDS.**—On July 29 the totals of the principal Massachusetts relief funds for soldiers on the Mexican frontier reached the following amounts:

Base Hospitals Fund .....	\$77,747.20
Volunteer Aid Fund .....	73,021.44
Special Aid Fund .....	10,008.40
Home Relief Fund .....	2,193.00
Eighth Regiment Fund .....	1,985.00

BOSTON AND NEW ENGLAND.

**THE WEEK'S DEATH RATE IN BOSTON.**—During the week ending July 29, 1916, there were 169 deaths reported, with a rate of 11.59 per 1000 population, as compared with 222 and a rate of 15.47 for the corresponding week of



last year. There were 25 deaths under 1 year, as compared with 39 last year, and 38 deaths over 60 years of age, against 57 last year.

During the week the number of cases of principal reportable diseases were: diphtheria, 27; scarlet fever, 10; measles, 77; whooping cough, 31; typhoid fever, 6; tuberculosis, 54.

Included in the above were the following cases of non-residents: diphtheria 6; scarlet fever, 2; tuberculosis, 5.

Total deaths from these diseases were: diphtheria, 1; measles, 5; tuberculosis, 18; whooping cough, 1.

Included in the above were the following deaths of non-residents: diphtheria 1; measles, 1; tuberculosis, 18.

**TYPHOID CARRIERS.**—The history of a family of typhoid carriers is told in the monthly bulletin of the Connecticut State Board of Health. The carriers in this instance were the immunized parents of children ill with typhoid. The two children, who lived on farms near Hartford, were taken sick with typhoid the first week in August.

"Each farm was sending milk to the city, so during the sickness the cows were boarded at another farm. In one case the infection of the milk had already been accomplished, and on this route sixty-one cases developed in the next four weeks. This figure shows at once how unpasteurized milk may be an unknown danger to its consumers.

"At the farms the members of the families were all immunized by the physician. The cases had an uneventful run, and by the end of August the children were apparently well. Before returning the cows to the farm it was deemed best to make sure that all the persons on the premises were free from infection. The parents, who took turns in nursing in both the families, the other two children and the children who had been sick were found all to be carriers, but three other adults in the families, less closely in touch with the patients were cleared. The two sick children cleared themselves of typhoid indications by the first of October, two months after the infection had been discovered, and the other two children were free shortly afterwards. But all four parents carried the disease germs till December, two months longer, although they had never had the fever.

"This observation shows a new way in which care must be exercised in dealing with typhoid, for there is danger of spreading the disease through the fact that immune attendants may become carriers."

**BOSTON BABY HYGIENE ASSOCIATION.**—A recent report of the Boston Baby Hygiene Association states that during the past week 1891 infants were under care by the Association, be-

ing 200 more than during the corresponding week of last year. Of these babies, 695 attended the well baby conferences and 1286 were visited in their homes by the sixteen nurses maintained by the organization.

**NEW PATHOLOGICAL LABORATORY.**—The July issue of the Bulletin of the Massachusetts State Board of Insanity reports that "on June 7 the State Board voted to establish, with the approval of the trustees of the Grafton State Hospital, a branch of the Pathological Service at the Summer Street department of the Grafton State Hospital, and there to make a new center for the investigation and treatment of brain syphilis.

"On the same date the Board voted to appoint Dr. Douglas A. Thom as assistant pathologist to the Board, to date from July 1, the Grafton State Hospital having kindly consented to provide for his maintenance and housing at the Worcester department. The major part of Dr. Thom's work will be in connection with the syphilis experimental treatments in special wards for male and female patients, as arranged for by Dr. May. The re-arrangement of the Summer Street building at Worcester will permit ample accommodations for the new branch of the Pathological Service, and includes an office for the assistant pathologist, space for the technician and room for the stenographer.

"This extension of the service will also relieve Dr. M. M. Canavan, who has been very much overworked by the development of the service. Dr. Thom will be able to undertake and investigate the work of accidents and sudden deaths for the middle and western parts of the State, namely, in six institutions.

"This plan of the State Board and the pathologist to establish a separate Psychopathic Department for the middle and western parts of the State has been made possible through the active and effective interest which Dr. James V. May and the trustees of the Grafton State Hospital have taken."

**THE LONG ISLAND HOSPITAL, BOSTON.**—The nineteenth annual report of the Boston Infirmary Department for the year ended January 31, 1916, states that the average population of the Hospital, 1014, shows an increase of fourteen over the previous year. In August the people housed at the Charlestown Almshouse were transferred to Long Island. Of the 112 persons who were in the institution at the time of removal, all but 13 men and three women have been received at the Long Island Hospital. The necessity for laboratory facilities at the Hospital is emphasized and suitable accommodations urged for the establishment of a laboratory where the abundant clinical material of-



ferred may be utilized. The opportunities at Long Island are exceptional for the thorough study of disease in many of its distressing forms, but without proper facilities, productive work cannot be accomplished.

**HOSPITAL BEQUESTS AND GIFTS.**—The will of the late Sarah E. Stickney, who died in Newburyport, Mass., on June 25, was filed on July 24 in the Essex County Probate Court at Salem, Mass. It contains bequests of \$500 each to the Columbia Hospital, of Columbia, S. C., and to the Anna Jacques Hospital of Newburyport.

The recently filed will of the late Caroline M. Dana, who died on July 22, contains bequests of one-tenth of her estate each to the Industrial School for Crippled and Deformed Children, the New England Hospital for Women and Children, and the Children's Hospital, Boston.

Mr. Frederick Fanning Ayer, of Lowell, Mass., has recently made to the Lowell General Hospital an additional gift of \$200,000, of which he requests that \$130,000 be used to construct a new hospital building 200 feet in length and two stories high, to afford an operating room and living accommodation for twenty nurses. The income of the remaining \$70,000 is to be used for the general purposes of the hospital. The Lowell Hospital at present accommodates 60 patients, but with the construction of further new buildings, for which the plans have been already drawn and approved, it will accommodate 160. The total of Mr. Ayer's gifts to the Hospital now amounts to \$620,000.

The will of the late Alice G. H. Dwinell, of Brookline, Mass., which was recently filed at the Norfolk County Probate Court, contains bequests of \$200 each to the Boston Lying-in Hospital and the Industrial School for Crippled and Deformed Children.

The will of the late Ellen Dunn of Salem, Mass., who died on July 12, was probated on July 25. It contains a bequest of \$200 to the Carney Hospital.

**TUBERCULOSIS SURVEY.**—It is announced that the National Association for the Study and Prevention of Tuberculosis purposes to expend \$100,000 for an experimental three-year survey of tuberculosis in two selected towns of Massachusetts and New York. Among the towns under consideration are Canandaigua, Johnstown, and Patchogue, N. Y., and Framingham, Wrentham, and Norwood, Mass. In each town selected, every case of tuberculosis and every contact will be examined frequently and kept under constant observation. The purpose of the experiment, which will be in charge of Dr. Donald B. Armstrong of New York City, and Dr. Edward R. Baldwin, of Saranac Lake, N. Y., is to determine the absolute and relative values of various methods of combating the disease.

## Miscellany.

### NEW METHOD OF MAKING ANTI-HOG-CHOLERA SERUM.

A NEW method of preparing anti-hog-cholera serum, which permits the economical production of a clear sterilized product, has just been described in the *Journal of Agricultural Research* of the United States Department of Agriculture. The advantage claimed for the new method is that it makes possible the production of an anti-hog-cholera serum which can be quickly sterilized by heat to a point that will absolutely kill any germs of foot-and-mouth disease, and so yield a serum that is absolutely safe, even if taken from a hog which might harbor foot-and-mouth disease, and yet give no indication of being infected.

The method, as described by its discoverers, Dr. Marion Dorset and R. R. Henley, of the Biochemic Division, Bureau of Animal Industry, consists in adding a slight amount of an extract from ordinary white navy beans to the defibrinated hog-cholera-immune blood, which has been the form of the serum used in the past. The addition of this bean extract causes the red cells of the blood to agglutinate, and when the mixture is whirled on a centrifuge the red cells pack together and form a rather stiff jelly-like mass. It is then possible to pour off a clear serum, leaving behind the red cells, which play no part in preventing hog cholera, and which, in fact, simply tend to dilute the serum and render its sterilization by heat impracticable. To increase the yield of clear serum the discoverers added a small amount of ordinary salt and found that they obtained from 70 to 74% of clear serum. The clear serum thus obtained it was found could be heated for 30 minutes at a temperature of 60 degrees Centigrade without changing its consistency or lessening in any way its effectiveness in preventing hog cholera. The heating to this point for this time is more than sufficient to kill any germs of foot-and-mouth disease which might accidentally be present. Practical tests with hogs show that probably all of the antibodies useful in combating hog cholera were retained in the serum, and the red cells extracted contained so few, if any, of these valuable bodies as to make the residue of red cells useless in preventing the disease.

Before the clear serum was developed, many attempts were made to sterilize by heat in a practicable way the ordinary defibrinated blood. It was found, however, that heating the old product up to 60 degrees Centigrade resulted in more or less complete coagulation of the defibrinated blood and in the destruction of the serum so far as its commercial worth is concerned. It was found that the highest temperature that could be used was 50 degrees Centigrade, and it was necessary to keep the old



serum at this temperature for 12 hours to make certain that the virus of foot-and-mouth disease was killed. Heating serum at a steady temperature over this long period in ordinary practice is difficult and too expensive.

Attempts also were made to make a clear serum by centrifugalizing. It was found, however, that while the centrifuge would separate to some extent the red cells, they were in such shape that it was difficult to separate the serum completely. An important quantity of antibodies was left behind in the red clot, and the resulting product was a cloudy rather than a clear serum. With this process, moreover, it was possible ordinarily to secure only about 50% of serum. Under the new method it is possible to secure as high as 74% of clear serum, which, in actual test, has proved to be fully potent. This clear serum, moreover, can be completely sterilized in 30 minutes, whereas the old serum had to be heated steadily for 12 hours.

*The new form of serum, as far as the Department knows, is not yet being made or put on sale by the commercial serum laboratories. As this process was discovered by the Federal government, any one in the United States is free to use it.*

#### UNITED STATES MEDICAL RESERVE CORPS.

At the examination recently held in various cities throughout the United States the following-named medical men successfully passed the examination for appointment as assistant surgeon in the Medical Reserve Corps, with a view to subsequent examination for appointment in the Medical Corps of the Navy:

James A. Halpin, M.D., Washington, D. C.  
William D. Heaton, M.D., Wahoo, Neb.  
Aubrey M. Larsen, M.D., Salt Lake City, Utah.  
Lincoln Humphreys, M.D., Argenta, Arkansas.  
Theo. Edward Cox, M.D., Cleveland, Ohio.  
Arthur W. Houghland, M.D., Minneapolis, Minn.  
Carroll H. Francis, M.D., Camden, N. J.  
Harold L. Jenson, M.D., San Francisco, Cal.

#### SOCIETY NOTICE.

AMERICAN ELECTRO-THERAPEUTIC ASSOCIATION.—The next annual meeting of the American Electro-Therapeutic Association will be held at the Hotel Marlborough, New York City, September 12, 13 and 14, 1916.

#### APPOINTMENTS.

ROCKEFELLER INSTITUTE.—The Board of Scientific Directors of the Rockefeller Institute for Medical Research announces the following promotions and appointments:

*Dr. Alphonse R. Dochez*, hitherto an associate in medicine, has been made an associate member.

*Dr. Henry T. Chickering* has been appointed resident physician in the hospital to succeed Dr. Dochez.

The following have been made associates:

*Dr. Louise Pearce*, pathology and bacteriology.

*Dr. Frederick L. Gates*, pathology and bacteriology.

The following have been made assistants:

*Dr. Oswald Robertson*, pathology and bacteriology.

*Ernest Wildman*, chemistry.

The following new appointments have been made:

*Dr. Rhoda Erdmann*, associate in the department of animal pathology.

*Dr. Rufus A. Morrison*, assistant in medicine and assistant resident physician.

*Dr. John Northrup*, assistant in the department of experimental biology.

*Dr. Jean Oliver*, assistant in the department of pathology and bacteriology.

*Dr. Ernest W. Smillie*, fellow in the department of animal pathology.

*Dr. William D. Witherbee*, assistant.

Hardolph Wasteney, hitherto an associate in the department of experimental biology, has accepted an appointment as associate professor of pharmacology in the University of California.

#### RECENT DEATHS.

DR. EDWARD FRANCIS HODGES, who died recently at Cavendish, Vt., of heart disease, was born in Boston on Aug. 1, 1851. As a boy he attended the Boston Latin School, in the days of Dr. Francis Gardner, and under Dr. Soule. He graduated from Harvard with the class of '71, and then studied medicine in Washington. He received the degree of M.D. from Georgetown University in 1874 and from Harvard in 1877. In 1880 Dr. Hodges moved to Indianapolis, Ind., where he continued in the practice of his profession until he gave up active work, several years ago.

Dr. Hodges was a Fellow of the Massachusetts Medical Society from 1875 until 1888. He was professor of obstetrics in the Medical College of Indiana from 1884 to 1905, and professor of obstetrics in Indiana University from 1905 to 1912.

Dr. Hodges is survived by his widow, formerly Miss Laura Fletcher, and one son, Dr. Fletcher Hodges, a physician in Indianapolis.

DR. SIR VICTOR A. H. HORSLEY, the celebrated British surgeon, died of heat stroke in Mesopotamia on July 16. He was born in 1857 and professionally was particularly noted for his work in cranial surgery. He was knighted in 1902, and since his retirement in 1906 had been emeritus professor of clinical surgery and consulting surgeon at the University College Hospital of London.

DR. CHARLES R. E. KOCH of Chicago, who died recently at Newton, Mass., was born in Polish Prussia in 1834 and migrated to the United States as a child. In 1860 he enlisted in an Illinois regiment with which he served throughout the Civil War. Later he studied dentistry and practised his profession in Chicago for many years. He was, for a time, secretary of the dental department of Northwestern University and had served as inspector-general and adjutant-general of the Illinois National Guard. During the Spanish War he organized and maintained a regiment at his own expense. He was a member of many dental organizations and was the author of a history of dentistry and of several works of military history. He is survived by his widow.

SIR WILLIAM RAMSAY, the celebrated British chemist, who died on July 23, at Beachcroft, Hazelmere, Bucks, England, was born in Glasgow on October 2, 1853. He became president of the British Association for the Advancement of Science and received the honor of knighthood in 1902. In 1904 he was awarded the Nobel prize in chemistry. He is chiefly noted for his researches on radium in 1907 and for his theory of the transmutation of elements announced in 1913.

DR. CLARENCE A. KIRKPATRICK of Philadelphia, a medical missionary at Namkham, in the Province of Burma, India, has died there recently. He was a graduate of the University of Pennsylvania.



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## Original Articles.

### THE DIAGNOSIS AND MANAGEMENT OF VASOMOTOR DISTURBANCES OF THE UPPER AIR PASSAGES.\*

By J. L. GOODALE, M.D., BOSTON.

It has been known for some years that an individual sensitized to a given proteid may exhibit a characteristic reaction if the proteid is brought in a soluble form in sufficient concentration into contact with a scratch of the skin. In the present connection it is of importance for us to recognize and interpret correctly the significance of this skin reaction. I shall, therefore, briefly describe it and its various degrees of intensity.

The proteid to be tested is applied to a scratch on the skin of the arm. After five to fifteen minutes the positive reactions are indicated by varying degrees of local disturbance. These disturbances of the skin may be ranged in order of intensity as follows: In some cases the first perceptible alteration consists in a sharply circumscribed white area, not elevated, bordering the scratch for a distance of one to three millimeters. We may find in other individuals the first manifestation to consist of a slightly reddened raised area. In more pronounced disturbances the area of swelling is more extensive, and is more or less white in color, being surrounded by an area of reddening of

varying size. When this degree of disturbance appears, it is usually accompanied by itching. It may, in marked cases, attain a considerable size, the edematous area reaching two to three centimeters or more in diameter and surrounded by a centimeter or more of hyperemia.

In the course of thirty minutes, or at most one hour, the reaction fades, and only the slight trauma occasioned by the scratch is left. In the case of certain proteids there may appear on the following day an alteration at the site of the scratch characterized by appearances of inflammation rather than of angioneurotic disturbance. The skin bordering the scratch becomes reddened, slightly elevated and firm. In the course of another twenty-four hours a trace of suppuration may supervene. These disturbances disappear in two or three days. It was at first thought that these inflammatory manifestations were the result of a chance infection, but they have occurred so regularly after testing with certain proteids as to suggest a definite relationship to the proteid substance itself. They follow most frequently tests with staphylococcus *p. aureus* and albus and streptococcus *pyogenes*. Among the foods, cocoa is apt to show it.

While the occurrence of the skin reaction may be regarded as indicative of sensitization to the proteid employed, yet it is premature to say that a direct relationship invariably exists. Certain observations, for instance, made in the course of hay-fever immunization, which I have elsewhere recorded, show that there is not always a skin reaction proportionate to the intensity of the nasal and ocular symptoms.

\* Read before the American Laryngological Association, May 9, 1916, at Washington, D. C.



During the past two years over four hundred cases showing vasomotor disturbances of the upper air passages were examined by the skin test with different proteids, for the purpose of determining, if possible, the diagnostic value of this reaction, and ascertaining its relationship to the clinical manifestations. For many of these disturbances the special exciting proteid was indicated by the patient's history, as in cases of hay-fever, intolerance to fish, horses, eggs, etc., but exclusive of the hay-fever patients, the larger number gave a clinical history in which the causative agent was unknown to the patient.

Cases of vasomotor rhinitis of recognizable reflex origin and asthma from cardiac and renal disease are not included. In many instances, particularly of nasal disturbances, the diagnosis of a reflex cause, such as from the genital organs, is difficult to establish, but wherever possible a physical examination from an internist or the family physician was obtained.

*Classification of Proteids.* Recent studies have established a phylogenetic classification of animals and plants, based upon the serum reactions. As the result of the studies, chiefly of Nuttall for animals and of Metz and Gohlke for plants, we are enabled to construct a phylogenetic tree for both kingdoms. The application of these studies to our subject is considerably simplified by our ability to eliminate many members of the animal and plant kingdoms, which have no direct relation to man.

*Animals.* The primitive proteid molecule in the animal kingdom represented by protozoa exhibits a differentiation in the direction of the molluscs or shell-fish, and passing upward gives off the branch of the crustacea. Above this are the vertebrates, with the branches respectively of fishes, birds, the main trunk terminating in the mammals. In the present connection the mammalian orders which concern us are represented by the domestic animals, and by those which serve as foods, or whose skins as articles of clothing.

*Plants.* The phylogenetic tree of the plant kingdom proceeds from the bacteria upward, and divides into the monocotyledons and dicotyledons, the first being represented chiefly by the large family of grasses and by the orders of iris and lily. The trunk of the dicotyledons terminates in the order Compositae, or family to which the ragweed belongs, and gives off along its course a large number of orders, which have been shown to be of anaphylactic significance, the most important members of these being the nuts, the legumes and the rose family.

*Preparation of Material.* It is of importance to have the test material in the form in which it exists when exciting symptoms. Consequently, we should have it either in the raw or cooked state, respectively, or in both, as the case may be.

It should also be in a stable form, and as pure and concentrated as possible.

This statement is especially emphasized by the fact that we find that different persons vary widely in their degree of sensitization to a given proteid; consequently, one person may react to a proteid dilution of a given strength, while another individual sensitized to the same proteid may require a hundred or more times greater strength of the solution to elicit an equivalent skin reaction.

In the case of animals, preparations should be made both of those parts capable of entering the respiratory mucous membrane, as flying scales or hairs, and also of the serum and of those parts ordinarily ingested, such as egg and milk. Extracts from the epidermal structures are easily obtained by placing scrapings from the skin, hairs or feathers respectively, in 12% alcohol. Sterilization is accomplished after a few days by the action of the alcohol, and the suspended particles of clear filtrate may then be used. The material may be tested for its sterility, but in no case have I found it contaminated, or even after months show signs of decomposition. These extracts appear to keep without deterioration, and I have now two made from horse epidermis, which have been kept at room temperature for over a year, and are apparently as active as when first prepared.

In the case of animal foods, crude but satisfactory material is readily prepared by expressing the juices in a meat press, and subjecting them to rapid desiccation by a blower.

The same method may be followed in the case of plant material. Oils may be removed by leaching with carbon tetrachloride. Both these animal and plant extracts may then be preserved when thoroughly dry without deterioration.

The proteids of egg and milk can be obtained commercially in the form of a pure powder as egg albumen and casein respectively.

While the refinement and separation of the different proteids present in a given material is desirable and represents a field of important research, yet the above-mentioned relatively crude preparations will suffice to answer our first clinical question as to whether the individual is sensitized to the material in question.

In the present work cases were examined both with preparations made along the above lines by Dr. Turnbull in the Throat Department of the Massachusetts General Hospital, and also by pure refined proteids prepared by Mr. R. P. Wodehouse in the Botanical Laboratories of Harvard University.

*Preparation of Bacteria.* Suspension of bacteria killed by coagulation of their albumen may be injected intradermally, and the presence or absence of a reaction noted on the following day, as already practised for a number of diagnostic tests, but I have also found it possible to procure the bacterial proteids in a soluble



form capable of exciting an immediate skin reaction in the same manner as that obtained from pollen and other plant and animal extracts. At the beginning of the work, cultures were grown by Dr. C. G. Page, instructor in bacteriology at the Harvard Medical School, on agar slants, when they were exposed to ether vapor, the object sought being to kill the micro-organisms without coagulation of their albuminous constituents. After remaining in ether vapor four days, the colonies were transferred to a 12% dilution of alcohol with water, in order to extract, if possible, the proteids of the bacteria. This alcoholic dilution was chosen as it has been found by the writer to preserve best the anaphylactogenic properties of pollen and keratin extracts. The quantity of bacteria was about one-third by volume that of the alcohol dilution added; so that, on centrifuging, the bacterial bodies occupied one-third and the fluid two-thirds of the tubes. After a week, the fluids were tested on the skin of patients in the same manner as that employed for the diagnosis of plant sensitizations.

Since then a variety of methods of preparing bacteriological material has been developed by Dr. A. E. Steele of the Massachusetts General Hospital, Dr. I. C. Walker at the Peter Bent Brigham Hospital, Dr. Cleveland Floyd and Mr. H. M. Baker at the Harvard Medical School, to all of whom I am greatly indebted for the opportunity which they have given me to test preparations made with this object in view.

In the case of plant pollen, I prefer to keep it in a dry form, as it will then stay unchanged for an indefinite period. I have flowering specimens of grasses and of ragweed in my herbarium gathered over thirty years ago, the pollen of which still gives pronounced skin reactions in patients sensitized to these plants.

A method was evolved by Mr. Wodehouse for the extraction of ragweed pollen from the flower heads, which enables one to obtain it in a purer form than has hitherto been the case. Plants of ragweed are gathered in the flowering stage and the flowers stripped off. The habit of this plant is to open the flower heads in succession, and consequently at a given time some will be found to have discharged their pollen and others to be as yet unopened. After drying in air the heads of flowers were washed in carbon tetrachloride to remove oils, etc., and it was found that most of the pollen came out in the process. Very little solid matter except the pollen will pass through the muslin used for straining. The pollen grains having passed through are allowed to dry and are seen to be somewhat paler than those obtained in the natural way, the difference in color being probably due to the removal of lecithin.

The same method is applicable to the other anemophilous plants, which furnish a large amount of pollen.

We are thus enabled to obtain the pollen in a

relatively pure form and consequently can make solutions of known proteid strength. Furthermore, this material has not been subjected to the risk of change by treatment with proteid precipitants and approximates closely to the original proteids in their natural state, as they actually reach the exposed mucous membranes.

Experiments were undertaken in regard to preserving pollen and pollen extracts. As I have stated in a previous paper, a dilution of alcohol in water proved most serviceable. The important object to be attained is a solution which will check decomposition, with the minimum loss of strength of the active principle. It was found that pollen extract in 6% alcohol or less showed after a few days development of bacteria and proteid decomposition. A dilution of 8 to 10% was sufficient to check putrefaction, and if the bottle was completely filled with the solution it remained free from alteration. If, however, the bottle was frequently opened or left half full, there was a prompt invasion of the yeast organism with development of vinous odor. This was later followed by the appearance of the *Mycoderma vini* and general turbidity. Solutions from 12 to 15% could be left open without alteration and there was no development in them of the *Mycoderma*. These solutions were found to contain an unstable albumen and a relatively stable proteose. The former is readily coagulated by exposure to air, by treatment with alcohol of above 20%, and by heating to 60° C. The proteose, on the contrary, suffers but little on exposure to air, and will endure boiling without precipitation. This observation is in harmony with the familiar fact in wine-making that at the close of the first fermentation a clear fluid is present containing the albuminoids of the grape in solution. These are in part thrown down at the first racking and consequent exposure to oxygen, rendering the wine turbid, and requiring often the admixture of isinglass to effect a clarification.

For this reason pollen solutions should be kept as far as possible from exposure to air, and if in the older ones a cloudiness occurs, it should not be filtered, as thereby the albumen would be removed, leaving only the proteose in solution.

The globulins of the pollen grain were separated by Mr. Wodehouse, but were found to be without anaphylactogenic properties.

#### METHOD OF ENTRANCE OF FOREIGN PROTEIDS INTO THE BODY.

Obviously under natural conditions the mucous membranes of the respiratory and the intestinal tract afford ready means of access for these substances when inhaled or ingested, and we may consequently speak of such forms of allergy as (1) inhalation or (2) ingestion anaphylaxis.

The possible existence of a third form should be considered, namely where the symptoms may arise from (3) autolysis of bacterial proteids



when in contact with the mucous membranes. In a recent paper I have called attention to this possibility, and have shown that in certain cases of perennial vasomotor rhinitis and bronchitis, it is possible to elicit an immediate skin reaction by the application of soluble bacterial proteids to a scratch. Since this paper was written further observations have tended to confirm these views. Such cases are dependent upon the more or less periodic invasion of the mucous membranes by the bacteria to which the individual is sensitized; during the intervals of infection, the patient remaining free from vasomotor disturbance.

At least two other possible bacterial causes may exist. In the first instance it is theoretically possible that chronic septic foci, as in chronic tonsillitis, with accumulation of lacunar debris, may be the source of sensitizing proteids; also it is conceivable that the intestinal canal may permit the development of bacteria, which may undergo autolysis, and the consequent liberation of proteid material which is anaphylactic for the individual.

The above system of classification is a tentative one, and while for certain portions we may believe that we have sufficiently confirmatory evidence, we are not as yet in a position to accept it as a whole without further investigation.

In the present paper I have endeavored with this classification as a basis to study a series of vasomotor disturbances occurring in private practice and in the Throat Department of the Massachusetts General Hospital.

#### I. INHALATION ANAPHYLAXIS.

Under this heading two main types are recognizable, the first being seasonal, the second perennial. In the first instance we find that the symptoms appear at a definite time of the year, and are represented by the very large class of hay-fever patients, the symptoms coinciding with the flowering of the special plant in question. The second, or perennial form, occurs at any time of year whenever the exciting proteid enters the system through the respiratory tract, as in sneezing or asthma from the presence of horses and cats.

#### IA. SEASONAL INHALATION ANAPHYLAXIS OR HAY-FEVER.

In this affection recognition of the causative agent is considerably simplified by keeping in mind the following facts: In the first place our search should be chiefly directed to the monoecious or dioecious plants. As I have previously pointed out, it is those plants which distribute a large amount of pollen in the air which excite hay-fever symptoms. Entomophilous plants, which accomplish cross fertilization through the agency of insects, are able to be much more economical in the production of pollen, and it is

consequently not likely that such pollen can come in contact with exposed mucous surfaces under natural conditions. Such pollen, furthermore, is more viscid and sticky, the object evidently being to enable it to cling to the bodies of the insects which visit the plant in question. It is necessary, on the other hand, for anemophilous plants, which depend for their fertilization upon the agency of air currents, to produce a large amount of pollen, and pollen, furthermore, which is relatively light, and easily detached from the anthers.

Recognition of these facts enables us to determine with much more certainty the causes of hay-fever in a given locality. We may, therefore, pass over the entomophilous plants and confine our attention to the anemophilous representatives. Such are, in this vicinity, certain trees, especially maples and oaks, the grass family as a whole, and certain species of the wormwood family. Although the pines and other gymnosperms produce a very large amount of pollen, yet I have not so far found any instance of hay-fever being caused by them. It is in the next place necessary to consider the season of hay-fever symptoms. If they occur previous to the flowering of the grasses, we shall obviously have to look for the exciting cause in the early flowering shrubs and trees, and among these birch, maple and willow are chiefly responsible. About the middle or the last of May the oak begins to flower in this region, and tests should therefore be made for this family. The flowering period of these trees is relatively brief, and consequently the hay-fever occasioned by them is less likely to disturb seriously the patient's mode of life.

In the case of grasses we have a flowering period extending from the middle of May in this locality until the first week in July, and the attack of hay-fever which they may excite is not only more prolonged, but more severe.

Examination of the Compositae is very much simplified by recognizing that the proteid or active agent of all its members is essentially the same. While minor differences may exist, yet one active pollen will, for diagnostic purposes, cover the whole order. An interesting example of this is found in two of my patients who spend the winter in Cuba, and who there in February suffer severely from a plant known locally as *Eseoba amarga*, used by the natives to keep fleas from their dwellings, which has been identified for me by Professor Oakes Ames as *Parthenium hysterophorus* Linn. After the return of these patients to Boston in the early spring, they are free from hay-fever until the flowering of the grasses, when a moderately severe amount of vasomotor irritation appears and lasts until the first of July. They then remain comfortable until the middle of August, when severe hay-fever appears and lasts until frost. Examination shows that these patients are sensitized to grasses and to ragweed, and that the Cuban



plant excites marked skin reaction. Tests of this plant on numerous other sufferers from ragweed, who have never been in Cuba, excite marked skin reaction in all cases.

Tests, furthermore, of different members of the Compositae, from the earliest flowering ones, such as coltsfoot, to the late blooming asters, show that with sufficiently strong solutions all ragweed cases will develop skin reactions. Under natural conditions, however, throughout the greater part of the United States, the chief exciting cause among the Compositae is found in the ragweed, the structure of which will repay examination. It will be seen that the plant is characterized by the possession of long spikes containing the male flowers, and by the localization of the female flowers at the base of the spikes. The amount of pollen which this plant distributes is very large, and it is also extremely light. The flowers open in succession, beginning with the central spike, a few discharging daily, and the scattering of the pollen being consequently maintained for a long period. Another plant of the Compositae which resembles the ragweed in its method of flowering is the *Baccharis halimifolia*, a favorite plant in shrubberies, although its power of causing hay-fever has not hitherto been recorded. The plants are dioecious, and the amount of pollen formed is considerable. The more showy members of the Compositae such as field daisy, golden rod, asters and other garden representatives, possess a relatively small amount of pollen, as well as one of a more generally viscid character. Patients consequently more readily escape, unless the plants are brought into the house.

Examination of the present series of cases has led to the conclusion that the number of proteid types concerned in exciting symptoms is much smaller, at least for New England, than has previously been supposed. During the period preceding the flowering of the grasses, nine cases presented symptoms which terminated by the first or the middle of May, according to the seasons. These patients showed no sensitization to grasses, but reacted chiefly to the maple, birch and willow. Fifty-seven cases showed sensitization to grasses, and 183 were positive to ragweed, and other members of the Compositae. Sensitization to members of the rose family alone was found in but one case, although a number were found in association with grass sensitization, where it was evident that grasses were the predominating factor.

With regard to the July or midseason forms of hay-fever, I believe that, with exception of the chestnut and possibly some garden flowers, the chief causes are found either in some special distribution or exposure to either late blooming grasses or early blooming Compositae.

It is at this season also that the cases of olfactory vasomotor rhinitis or pseudo-hay-fever are most commonly found. In this affection the

fragrance of certain heavily scented flowers excites vasomotor disturbances, ranging all the way from sneezing to actual asthmatic paroxysms. The action of pollen can be definitely excluded by wetting or removing the anthers without influencing the vasomotor symptoms. Skin tests, furthermore, of the pollen show no reaction. The phenomena are plainly reflex, and the path of transmission appears to be along the olfactory rather than the optic nerve. The flowers most commonly responsible are lilies, hyacinths, sweet peas and peonies. The condition occurs either alone, or in association with true hay-fever, and is more common in neurotic or impressionable individuals, although not confined to such, several of my cases occurring in highly intelligent individuals, possessing no discoverable neurosis.

It may here be noted that during the hay-fever attack a general hypersensitiveness of the patient is apt to appear toward plants, for which at other seasons he shows only a minor or no reaction. One must therefore be on his guard at this time to observe carefully the relative preponderance or degree of development of the various skin reactions, and he will probably be safe in confining his therapeutic endeavors to the plant which causes the most marked disturbance.

#### II. PERENNIAL INHALATION ANAPHYLAXIS.

(a) Of Plant Origin. Under this heading I have included those cases of vasomotor disturbance in which the exciting proteid is derived from some other part of the plant than the pollen. Two cases of severe sensitization to flour were found in bakers, who, however, had no hay-fever, and who did not react to wheat or grass pollen. These cases, furthermore, could eat bread without disturbance. One case of sensitization to potato was found in a cook. Eight cases of severe sneezing from orris root were encountered in women using face powder containing this as an ingredient. Both the crude root of *Iris Florentina* and the commercially prepared orris powder produced in these cases marked skin reactions and vasomotor disturbances. In several of these patients the cause of the symptoms had not been previously suspected, but in all instances a complete subsidence followed the discontinuance of the face powder.

(b) Of Animal Origin. Forty-nine cases were found of sensitization to epidermal scales and hairs of animals or feathers of birds. The symptoms varied from vasomotor rhinitis to severe asthma when inhaling fine suspended particles of the special exciting substance in question. In all cases a definite reaction was elicited by the application of a keratin extract to a scratch of the skin. While the majority were aware of their sensitization, yet for a number of individuals the first recognition of the



cause was obtained by the test. This was especially found in the case of children.

Of the various animals, the horse was represented by forty-two cases, the dog by eight, and the cat by six. The sheep and cow gave in two cases respectively moderate but apparently definite reaction to keratin extracts from the natural hair, but it did not appear that the first case was affected by the dust from woolen blankets. In two cases definite vasomotor rhinitis was occasioned by the use of feather pillows, and keratin extracts from feathers of the chicken or duck gave well-defined skin reactions. The symptoms disappeared on the discontinuance of the feather pillow.

A distinct difference appears to exist between the proteid of the serum and that of the epidermal structures in the animals studied. In the case of the horse eleven patients gave marked reactions to the keratin extract but no reaction to the serum either in pure powder or as antitoxine. That this difference is not due to greater strength of the keratin extract employed is shown both by the fact that the majority of patients gave equally marked reactions to both serum and keratin, and by the observation made in one individual of a pronounced cutaneous reaction to horse serum, without a trace of disturbance from the keratin. This patient had had but little to do with horses, but had, thirty-eight years previously, been bitten by a colt. It is conceivable that in this manner a sensitization to the serum alone may have developed.

While the majority of the dog and cat cases reacted to keratin, both clinically and by the tests, yet two individuals were discovered who reacted to dog serum in a marked degree without sensitization to dog hair. Two similar cases were found reacting to cat serum alone. These four individuals had no discomfort when in the neighborhood of dogs or cats respectively.

Of the two cases of feather sensitization, one showed no reaction to eggs.

These observations indicate the necessity of employing keratin extracts as well as sera, when making diagnostic tests of sensitization. Furthermore, the probability is suggested that certain cases of horse-fever or horse asthma may in reality receive antitoxine without anaphylactic shock, if their sensitization is to the hair and not to the serum of the animal. Finally, the possibility is conversely suggested that the absence of symptoms from horses does not preclude the possibility of an anaphylactic shock from the administration of antitoxine.

## II. INGESTION ANAPHYLAXIS.

Twenty-eight cases were characterized by a more or less well-defined sensitization to various foods. This number does not represent the true relative frequency of such cases, since their study has been undertaken only during the

past six months, and many of the earlier ones may have escaped recognition.

These cases represent all gradations ranging between sensitizations so slight as to have excited no subjective symptoms on the part of the patient and extreme susceptibility in which contact of the smallest part of the proteid in question caused profound general disturbance. It was noted that the local sensations were referred to the throat, rather than to the region of the stomach. Such symptoms were described variously as tickling or itching in the throat, or, in more severe cases, as swelling and smarting. The general constitutional phenomena were in some cases definite asthmatic symptoms, in others urticaria. Eczema was found associated in a number of instances; psoriasis occurred once.

Animal foods were prepared for testing, as already described, and instances were found of sensitization to shell-fish, crustacea, fish of various sorts, egg, milk and meat. If the skin reaction was marked, the patients were usually aware of their idiosyncrasy. This applies particularly to intolerance to fish and eggs.

Milk was found in one instance to give severe asthma in a child seven years of age. This patient had had more or less constant asthma since being weaned. Physical examination by Dr. J. L. Morse was negative. The skin tests showed reaction to milk, horse and cat keratin. On discontinuing the milk, and keeping the cat away, the asthma ceased completely. At the end of two weeks the child was given cow's milk again, with a return of the asthmatic symptoms. This was allowed to continue for a week, and the milk discontinued, the asthma simultaneously disappearing. A week later he was allowed to play with the cat, whereupon asthma reappeared. On keeping him away from the cat, and giving milk at the beginning in drop doses, and gradually increasing, it was possible at the end of six months to establish a tolerance for a glass of milk. The child has during this time been free from asthma.

Cases of sensitization to egg have been referred to children's specialists for immunization by progressive doses, with successful results.

A case of sensitization to raw animal sera was found in a boy twelve years of age. This individual reacted to dog, cat, hog, sheep and ox serum, to a high degree. Horse serum and goat serum excited slight reaction. Guinea-pig serum gave no reaction. Tests with cooked beef and lamb gave no reaction. There was well-defined sensitization to keratin of dog, cat, horse and lamb, but none to that of the ox. Commercial casein and egg gave no reaction. This case indicates the desirability of having the animal foods prepared for testing under the form in which they are usually taken into the system.

In the case of plant foods we have likewise to prepare the material in the raw, boiled or roasted state, as the case may be. A variety of



proteid substances exists in plants, the greater part of which is coagulable by heat. While many proteid substances in aqueous solution require a temperature of 100° C. before being coagulated, others coagulate at 65° C. Proteoses withstand boiling, but may be precipitated by treatment with absolute alcohol. Eleven cases were found of sensitization to grains. In certain of these the patients had no subjective sensations. In four, however, it seemed probable that the asthmatic symptoms of which they complained were attributable to the eating of grains in the form of cereals and bread. Two of these cases are reported somewhat in detail.

CASE 1. G., 40. Asthma, since childhood, of unknown origin, more or less persistent throughout the year. No reactions were found to animal foods or to the pollen of grasses, and the patient had no hay-fever. Raw and boiled proteids of wheat, barley, oat, corn and rice gave marked skin reactions. Proteids extracted from the inside of bread gave reactions much less pronounced than the raw or the boiled material. Extracts prepared from well-browned toast and some roasted grains of wheat, corn and rice gave no reaction whatever. Various breakfast foods were tested, shredded wheat, triscuit, corn flakes, force, Kellogg's wheat biscuit and puffed rice giving no skin reaction. Grapenuts gave a pronounced reaction. The patient was negative for other plant foods with the exception of beans and peas. Bread and boiled cereals were omitted from his diet for a period of two weeks, during which time his asthma became much less, giving him at the close of this time practically no discomfort except on exertion. On eating again freely of bread, after two days the asthma returned in its original intensity, diminishing later when bread was omitted. When the roasted cereal foods above mentioned, which gave negative reactions, were introduced into the diet, there was no return of the asthmatic symptoms, and the patient is now in greatly improved general health.

CASE 2. S., 35. Asthma many years more or less constant. Hay-fever in spring, moderate. Marked reaction to wheat, raw and boiled, and to bread proteid. Marked reactions to raw and boiled proteids of oat, barley, rice and corn. Positive reactions were obtained also for cocoa and buckwheat. Squash, pea, almond, and Brazil-nut gave pronounced reactions. There was no reaction to beet, turnip, cabbage, parsnip, potato, eggs, fish or meat. This case was relieved very much of his asthma on omitting bread and grains, and the other plant foods to which he was sensitized. A proteid extract of wheat was treated with pancreatin for three days. This modified extract caused marked skin reactions. Wheat, rice and corn, heated to a temperature of 115° C., gave no reaction, and their proteids on treatment with pancreatin for three days gave no reaction.

These two cases indicate that certain proteids present in the grains are heat stable up to 100° C., but at 115° C. their anaphylactogenic property is destroyed, and is not reintroduced by pancreatic digestion.

Four cases of sensitization to potato, both raw

and boiled, were observed. In one of these only was there any systemic disturbance, this consisting in an urticarial eruption. Proteids from baked potatoes gave no skin reaction.

Cases were also encountered of sensitization to nuts, both walnuts, chestnuts, and Brazil nuts, some reacting also to almond, although this is derived from the rose family, and stands far removed in a botanical classification from the others. These cases did not react to the pollen of chestnut or the rose family, respectively. A few cases were found of sensitization to strawberries, bananas, oranges and apples in the raw state. Cooking, however, of the strawberries and apples made it possible for the patients to eat the fruits without discomfort. The inference here to be drawn is that the sensitizing proteid was coagulated or destroyed on boiling. The cases of clinical sensitization to grains as a rule had no hay-fever, and did not react to the pollen of grasses. It was, however, observed that cases of marked sensitization to grass pollen gave without exception a definite skin reaction to proteids, both boiled and raw, of grains. This observation suggests the probability that the pollen represents the specific plant proteid found throughout all its parts, as Metz and Gohlke have apparently shown, but that in the development of the ovule during the summer other proteids are formed with anaphylactogenic properties differing from those of the specific plant proteid, and that these seed and fruit proteids represent a high degree of differentiation among closely related species. This clinical observation receives confirmation from the works of Wells and Osborne.

These observers have isolated from the seeds of closely allied plants substances resembling proteoses, which are distinguishable from each other. They reach the conclusion that resemblances and differences of these substances are dependent upon the chemical constitution of the proteid molecule, rather than upon biological differences. They, for instance, found that zein, the alcohol soluble protein of corn, did not cause the anaphylactic reaction in animals sensitized with gliadin, the alcohol soluble proteid of wheat, nor with hordein, the alcohol soluble protein of barley. At that time hordein and gliadin had not been tested against one another, but it had been observed that preparations of gliadin from either wheat or rye interacted against one another, as if they were one and the same protein. On testing hordein from barley against gliadin from either wheat or rye, they have since found that these two proteins of different origin also react with one another. Furthermore, they have found, that while preparations of gliadin from wheat reacted anaphylactically with glutenin from the same seed, hordein from barley fails to cause reactions in guinea-pigs sensitized with glutenin.

It has seemed to me possible that these relationships between the specific plant proteid



found in the pollen, and those of the seeds and fruits may be represented graphically as follows: Taking, for instance, the Rosaceae, we may let A represent the specific proteid of the family found in the pollen and throughout all the parts of the plant. B, C and D may be taken to denote the fruit proteids of the apple, strawberry and almond, elaborated by the activity of the respective plants during the summer's growth. The proteids present in the fruits will therefore be AB, AC and AD. An individual sensitized to the pollen of the rose will react positively to the pollen of all the members of that order, and will also react to extracts from the fruits or seeds of B. If, however, he is sensitized to proteid B of the apple, he will react neither to the pollen of any of the rose family nor to proteid C of the strawberry nor to proteid D of the almond.

This hypothesis has apparently received confirmation from my observations on the Rosaceae and Gramineae, as already mentioned.

### III. AUTOLYSIS OF BACTERIAL PROTEIDS.

While the influence of proteids from animals and from flowering plants in the causation of anaphylactic symptoms is sufficiently recognized, yet the part which possibly bacterial proteids may play in these conditions is not yet clear. Clinically we find a large number of cases in which the influence of bacteria seems probable. We may divide these conditions provisionally into acute recurrent and chronic forms. In the first instance we find that the individual goes for considerable periods of time with little or no vasomotor disturbance, and that with the advent of an acute infection of the nasal or bronchial mucous membrane, he exhibits symptoms of vasomotor rhinitis or of asthma. The mucous membranes in these conditions do not show reddening or pus formation which are characteristic of acute rhinitis and acute bronchitis, but present rather the typical picture of hay-fever. After the cessation of the acute symptoms, the individual is free from asthma until the occurrence of another infection. The existence of chronic forms of bacterial infection have been recognized by clinicians as being represented on the one hand by chronic sinusitis and on the other by intestinal stasis, and we have probably all had cases where treatment or cure of these conditions has resulted in relieving the vasomotor symptoms. I believe that chronic lacunar tonsillitis with accumulation of detritus must be regarded also as a possible cause of proteid absorption.

In a recent paper<sup>1</sup> I have called attention to the possible explanation of such types of vasomotor disturbance, referring them to the solution or autolysis of bacterial proteids, to which the patient is sensitized. On this hypothesis both these acute and chronic forms of vasomotor rhinitis and asthma are dependent upon the occasional or constant anaphylactogenic action of

autolyzed bacteria. Experiments which were then reported for the purpose of determining whether bacterial proteids in solution could elicit skin reaction, showed that out of fifty cases positive reactions were obtained from the staphylococcus p. albus, aureus and citreus; also from a bacillus of the Friedlander type, and the micrococcus tetragenus. Since then further study has confirmed these observations, and reactions have been obtained in a number of cases from the bacillus of influenza, streptococcus pyogenes and viridans and the pneumococcus, Types I and II. It was also observed that after an attack of asthma the skin reaction could not be elicited, but returned again after a few weeks. Much still remains to be done before conclusions can be drawn as to the relation of these organisms to the vasomotor disturbance in question. If it should be confirmed that definite sensitizations to microorganisms exist on the part of these anaphylactic cases, our therapeutic work should receive a highly important assistance. We should, for instance, in the case of acute recurrent infections, be guided in the choice and administration of vaccines. The cases of chronic proteid absorption would be more intelligently approached in that we should be led to examine the patient with especial care for the purpose of removing, if possible, the foci of infection, or at least of draining and cleansing the regions in which prolonged contact of bacterial proteids may occur.

### ASSOCIATION OF FACTORS AND THE OCCURRENCE OF CLINICAL SYMPTOMS.

A review of the cases has shown that for the majority a variety of sensitizations is present. We find, for instance, often hay-fever disturbances from the pollen of different orders, while here and there hay-fever patients occur with sensitization also to bacterial proteids, certain classes of foods, or keratin desquamations.

In such cases our task is first to determine the factor which is responsible for the symptoms, and to place in proper perspective the relative influence of the other sensitizations to which the patient is subject. The line of inquiry is usually as follows: First, Are the symptoms strictly seasonal? In this case we shall obviously be able to disregard all factors except the various pollens. If the symptoms are perennial, inquiry is next made as to their relation to the occurrence of colds and acute infections. If the answer is confirmative and the patient states he is entirely free from discomfort except when suffering from a cold or acute bronchitis, we may feel justified in disregarding the influence of both inhaled and ingested proteids, and devote our attention to an examination of his reactions to the various bacteria concerned in acute infections of the upper air passages.

If the symptoms are more or less constant throughout the year, the possible influence of



domestic animals should be sought for, especially dogs and cats in the case of children. Nor must the possibility of orris root in toilet or sachet powder be forgotten. Inquiry is next made as to disturbance from different articles of foods, and here the tests should be first made for such substances as enter habitually into the diet. Thus, in order of importance, we place eggs, milk, meat, grains, legumes and potatoes, since if the patient is not sensitized to any of these, it is unlikely that the more occasional articles of diet, such as shell-fish, fish, root vegetables, greens and fruits are responsible.

If the above tests have resulted negatively, our attention should be directed to the possible existence of chronic absorption of bacterial proteids, and we may then proceed with the examination of the patient, as to his sinuses, tonsils and gastro-intestinal tract.

#### THE MANAGEMENT OF PATIENTS SHOWING HYPER-SUSCEPTIBILITY.

In symptoms arising from inhalation of sensitizing substances, if the exposure is likely to continue throughout the year, it is probably wiser to avoid the irritation than to seek to immunize the patient against it. We have at least as yet no record of successful immunization. A case which I reported last year of attempted immunization against horse asthma by the injection of horse serum and keratin extract showed a gain in tolerance to the presence of horses, but on the discontinuation of the treatment, the immunity was gradually lost, and the patient has now regained her original sensitiveness. Since for the successful preservation of the acquired resistance continuation of proteid administration is necessary, and inasmuch as we have yet developed no successful method which the patients would be willing to carry out for an indefinite period, it would seem preferable for the patient to accept his disability, and make the best of it.

Immunization against hay-fever by the injection of plant proteids has been described by other writers, and by myself in a previous paper, so that I shall not consider it here in detail. Before, however, we undertake the treatment, we should first decide whether the patient's discomfort is sufficient to justify us in starting him upon a course of procedure which may prove time-consuming and not wholly devoid of risk. The treatment is by no means to be compared to typhoid inoculation, but will require numerous visits with careful tests of the degree of progress in order to determine the correct dose for each occasion. I cannot too strongly emphasize the importance of this matter of dosage. We are dealing with agents capable in moderate overdose of causing unpleasant shock, and in sufficient amount, of leading promptly to a fatal result. The best advice that I can give one starting in this work is to test continually the patient's resistance, and to increase

the doses gradually in conformity with the skin or conjunctival tests.

In reviewing the results thus far obtained in three years' treatment of hay-fever by hypodermic injection, one must in the first place be guarded in accepting the statements of the patients themselves. As I have previously pointed out,<sup>7</sup> seasons vary, and the physical condition of the patient may, likewise, differ from year to year. Patients are all too ready to attribute a greater freedom from hay-fever symptoms to the treatment employed. It is only where the patient's statements are controlled by clinical tests that they may be accepted as possessing value. With this preliminary statement I will say that the majority of patients who received treatment in the past two summers expressed themselves as satisfied with the results accomplished. From those who felt themselves improved, however, a considerable number should be eliminated, as careful examination of their surroundings, the season and their physical condition might permit other explanations of the diminution in symptoms. The typical individual who presented himself for treatment two or three months before the expected season showed a progressive diminution in the intensity of the skin reactions, and a greater tolerance to the solution employed. In most instances, however, the patients did not escape entirely the hay-fever symptoms when the season came around. The typical behavior was as follows: Hay-fever appeared at the usual time or somewhat later, the latter possibly attributable to the season, and reached within a few days nearly its accustomed degree of intensity. This was, however, followed by a striking diminution in the symptoms, so that after the acme of discomfort had been reached, a very considerable degree of relief supervened, and most of these cases remained relatively or entirely free from trouble through the balance of the season. The impression was given in such cases that the amount of treatment which it had been possible to administer in the few weeks before the season was insufficient to effect a complete immunity, but that with the arrival of the season enough pollen was absorbed through the mucous membrane to push the patient, so to speak, over the line. The same results were apparently obtained when treatment was instituted at the beginning of the hay-fever season, and in the majority of such instances it was possible to bring about a relief of hay-fever symptoms several weeks before relief would ordinarily have been due.

I have received the impression consequently that we are not likely in the majority of cases with the present methods to do away completely with hay-fever symptoms in the course of a single season, but that, nevertheless, sufficient relief may be obtained to make it worth while to continue this method.

Where, however, treatment has been carried on during one season with more or less success,



it has been evident that a second course of treatment the following season is more distinctly efficacious.

The usual course of events here is as follows: At the close of the first hay-fever season one finds that the patient has attained a relatively high degree of immunity, which in the course of the winter progressively diminishes. Beginning again next season several weeks before the expected date for hay-fever, one injects a small dose carefully determined in the usual way, and follows this by larger doses. In practically all such cases a rapid striking diminution in the intensity of the skin reaction was observed, much more speedily than was the case during the first season. Such cases when the hay-fever season arrived were distinctly more benefited than during the previous year, more than half showing no or exceedingly trifling symptoms. The work is yet too young to enable us to say with certainty what the future will bring forth, but with our present information I should advise considerable caution in the statements to be made to the patients, and especially to explain to them that they may observe little or no benefit during the first season, but that the results obtained lead us to advise a following out of treatment for two years, with the reasonable expectation that the second season's treatment will be more helpful than the first.

Although feeding experiments in the past with extracts of ragweed do not appear to have been sufficiently successful to justify their general adoption, yet the work which internists have done with the treatment of egg sensitizations, has suggested the possibility that we may accomplish similar results by administering foods in a natural state derived from the order which produced the symptoms. Experiments were consequently undertaken during the past summer to determine whether the patients sensitized to ragweed pollen would present symptoms from the ingestion of proteid foods derived from the same family.

It was thought that if such internal administration was followed by the development of vasomotor symptoms, either of the skin or of the mucous membranes, an immunization might possibly be accomplished along the recognized lines of treating egg and other food sensitizations.

For this purpose sunflower and lettuce were taken, both being plants of the Compositae, to which the ragweed also belongs. The pollen of both was found to excite marked skin reaction in cases of autumnal hay-fever.

Extracts were made from the seeds of the Russian sunflower which gave positive results, but the intensity of the skin reaction was inferior to that excited by the pollen. The seeds were given to ten hay-fever patients with the direction that they should chew them thoroughly and swallow shortly before their regular meals, with the idea that a certain amount of

the proteid might pass into the system directly without digestive alteration. In nine adult cases, however, no gastric discomfort was noted or any influence upon the hay-fever symptoms. Oil-free meal from sunflower seeds was prepared, which on the skin excited a moderate or marked skin reaction, depending upon the sensitization of the individual. This was administered internally in doses of one to two grams, without exciting symptoms of any kind whatever. One patient, a boy, said that his hay-fever was made worse after eating the sunflower seeds.

In the case of lettuce a strong extract was made from the seeds in a 5% sodium chloride solution, which gave a weak reaction. A strong solution of lettuce leaves in a 10% sodium chloride solution (proteins shown to be present by preliminary test) gave a negative reaction.

The amount of proteid present in the lettuce leaf is evidently too small to excite any disturbance, and with one doubtful exception, no patients had noted any influence upon their hay-fever from eating it in abundance.

It would appear consequently probable that we have no foods of the Compositae order, the ingestion of which is likely to influence the course of ragweed hay-fever.

In the course of this work it has become evident that many individuals exist who show definite anaphylactic skin reactions to various classes of foods, and the problem which here confronts us is to determine to what extent the clinical vasomotor symptoms are dependent upon such a hypersusceptibility. It has in some instances seemed indicated that certain individuals possess food sensitizations either partly developed or measurably overcome through the acquisition of progressively increasing tolerance, in whom the actual vasomotor explosion is in reality dependent upon some other proteid cause. The following case illustrates this possibility.

D., male, 40. Asthma severe, nearly constant for many years. Marked polypoid degeneration of middle turbinates with involvement of antra. Skin tests were positive for staphylococcus p. albus and a diphtheroid bacillus; negative for pneumococcus, the influenza bacillus, micrococcus catarrhalis and staphylococcus p. aureus. Positive reactions were obtained from proteid extracts of wheat, barley, corn, rice, pea, orange and cocoa. Negative or slight reactions were obtained from egg, milk, beef, mutton, fish, potato, carrot, beet, parsnip, squash and cabbage. Keratin extracts of domestic animals and birds were negative. The patient was put upon a diet containing only those foods to which he was negative, but without perceptible influence upon the asthma. No operation has as yet been done upon his sinuses, but in view of the above observations this seems the measure most reasonable to undertake.

Conditions of highly developed sensitization to foods have been studied by numerous observ-



ers, especially Schloss, Talbot and Chappell. It has been evident that children are much more prone to exhibit anaphylactic phenomena from foods than is the case in adults,—a fact possibly due to the greater absorptive power of the gastric mucous membrane in children, or to the acquisition of partial immunity in adults.

If the proteid enters into the accepted articles of diet, experiments have shown that immunity can be obtained in the majority of cases by administering it in small and progressively increasing amount. The details of treatment may be found sufficiently described by the authors mentioned.

The management of cases in which the vasomotor symptoms either demonstrably or by exclusion are attributable to the absorption through the mucous membrane of bacterial proteids is to be undertaken along lines already indicated. Aente recurrent infections may perhaps be checked by the administration of vaccines. The sensitized individual presents here an advantage in that it may be found possible to select for him with accuracy the special organism required.

Foci of chronic inflammation or sepsis should be drained or removed. In three of my cases of long-standing asthma, the excision of septic tonsils was followed by entire relief.

Cases of intestinal stasis should be treated by the internist or the orthopedic surgeon, as circumstances may require. Two cases of asthma with ptosis of the viscera were relieved by the application of a proper support.

#### CONCLUSIONS.

In a large proportion of vasomotor diseases of the upper air passages the disturbances are dependent upon the entrance of a foreign proteid into the system. The method of entrance may be through the contact of the proteid in question with mucous membranes of the respiratory or of the gastro-intestinal tract by inhalation or ingestion respectively. Foreign proteids may perhaps also develop in or upon these mucous membranes through autolysis of pathogenic or saprophytic bacteria. The application of the skin test to these conditions is of diagnostic value when employed with a recognition of the phylogenetic relationships of animals and plants, as determined by studies in sero-biology.

Proteid material for testing should be prepared both from the keratin and sera of domestic animals, from the pollen of the chief causes of hay-fever, and from the various articles of food, which enter commonly into the diet. Bacterial proteids derived from the various invaders of the respiratory tract should be available either in solution or in soluble form.

When the skin reactions to the various classes of pollen proteids have been determined, the management of cases will depend largely upon the relative preponderance of the local reactions

in relation to the clinical history. If the cause is found to be seasonal, as in hay-fever, immunizing treatment by injection of pollen extracts is likely to prove of service. The sensitization returns during the following winter, and treatment must probably be repeated annually. If the cause is perennial and is due to inhalation of foreign proteids, it is wiser to avoid the cause rather than to seek to effect a cure by immunization. If the disturbing proteid enters into the ordinary articles of diet, a tolerance may be gradually established by feeding the substance in progressively increasing doses. Disturbances of bacterial origin have not yet been sufficiently studied to enable the formulation of a definite plan of treatment; but the results of these investigations confirm our present methods of treatment, and emphasize the importance of draining regions which can retain the products of bacterial activity. Septic foci should be removed. Vaccine therapy is likely in such anaphylactic cases to be more accurately guided than in the ordinary individual.

The results already accomplished in the case of this clinical investigation has led me to the conclusion that we possess in the intelligent application of the skin test a very definite aid in the diagnosis and consequent management of our cases of vasomotor disturbances of the upper air passages. We are as yet only at the entrance of this field, and its exploration must be carried out by the coöperation of laboratory workers in chemistry and serobiology.

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## ASTHMA IN CHILDREN, II. ITS RELATION TO ANAPHYLAXIS.

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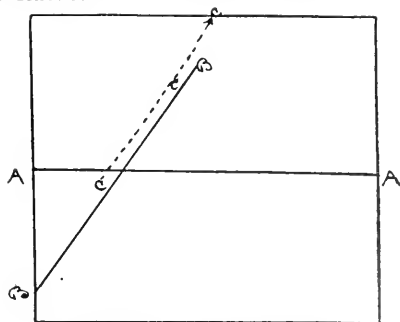
IN 1914 the writer reported six cases of asthma in children due to eggs.<sup>1</sup> Later, more careful review of the literature showed that Meltzer<sup>2</sup> was one of the earliest investigators to attribute the symptoms of asthma to anaphylaxis, on the basis of observations he had made on animals. Koessler<sup>3</sup> (1913) and Lesné and Richet<sup>4</sup> (1913) reported cases of asthma in young children caused by eggs. Richet<sup>5</sup> noted that cooking diminishes, but does not always remove, the toxicity of eggs. Recently opportunity has been afforded to study a series of cases



which have modified and broadened the conception of the etiological factors concerned in the production of asthma, and much more delicate materials have been used in the tests.

The histories of most of the cases studied have shown that there is a hereditary predisposition to allergy; that the parents or close relatives of the children have asthma, hay fever, or an idiosyncrasy to some food. During the year of 1914-15 the writer made a routine skin test for egg albumen on all the children and infants admitted to the Children's Ward at the Massachusetts General Hospital, and out of 85 admissions, three infants gave a positive skin test to egg albumen. They were respectively, three, four and eight months of age. The mothers of the infants, on being carefully questioned, said that the babies had never eaten egg in any form. A fourth case, in private practice, aged fourteen months, which had never eaten egg, gave a positive skin test to egg white. Schloss and Worthen<sup>6</sup> report the same results in two infants, and Blackfan<sup>7</sup> in one nine weeks old infant. It seems certain, therefore, that these infants had a hereditary and not an acquired sensitization to egg.

Sensitization may be acquired. It has been shown that the intestinal mucous membrane of the new-born infant is permeable to foreign protein for a short time after birth, and that later the foreign protein will not pass through the mucous membrane into the blood (when given in normal amounts), unless the mucous membrane is damaged.<sup>8</sup> Recently Schloss and Worthen<sup>6</sup> showed that whereas the healthy digestive canal of infants could take care of a small amount of foreign albumen (in this instance, egg albumen), large amounts passed through the intestinal mucous membrane unchanged, and could be demonstrated in both the blood and the urine. This investigation is of great importance since it explains many phases of asthma for which no satisfactory explanation could be given. Graphically it may be shown as follows:



A-A The limit of tolerance to foreign protein.

B-B Increasing amounts of foreign protein.

C-C To immunity.

Diagram of theoretical action of foreign protein in a sensitive case.

Any amount of the foreign protein below the line A-A, which represents the limit of tolerance, will be digested and changed so that none enters the body, while any greater amount will gain entrance to the body through the intestinal mucous membrane. Let the line B-B represent increasing amounts of foreign protein (for example, egg albumen). When the line B-B passes above the line A-A, the amount of protein given is greater than can be tolerated, and presumably passes into the body unchanged. One of two things results,—either the limit of tolerance is increased and immunity is established for that amount, as shown by diverting line A up the dotted line C-C, or some symptoms appear, which make it impossible to continue with such large amounts of the foreign protein.

During the past two and a half years a series of investigations, especially by Goodale<sup>9</sup> and Walker,<sup>10</sup> have made it possible to divide asthma and the allied condition, hay fever, etiologically into three types.\*

Inspired	Hay fever—pollens <sup>10</sup>	
	Dust and hairs from animals <sup>9, 12</sup>	Horse Cat Dog Guinea-pig, etc.
	(a) animal foods, egg, beef juice, etc.	
	(b) vegetables, oatmeal, lentils, etc.	
Ingested foods	(c) milk	
	(d) fruits	
	(e) nuts	
	(f) fish and shell fish	
Bacterial <sup>10</sup>		

The problem in children is quite different from that in adults, since during the first year of life sensitization to the foods alone is seen. The youngest recorded cases of asthma are respectively fourteen and twenty-eight days old.<sup>13</sup> As the child grows older, inspired asthma becomes more frequent, with increasing exposure to pollens and dusts, but this type is only a small proportion of the whole. A larger proportion of cases are still due to foods, and for that reason the writer's investigations have been confined almost wholly to the foodstuffs.

Since food idiosyncrasies and allergy, with resulting asthma, tend to cure themselves spontaneously in childhood, the proportion of cases of asthma due to ingested foods becomes smaller with increasing age, while the proportion of those due to inspired materials become larger. In later childhood and adult life there were many puzzling cases which were unexplainable until Goodale showed that asthmatics may give a positive skin test to bacteria, which presumably explains this group of cases. As the child becomes older it contracts infectious diseases, which, on proper soil, may be so spaced in time as to cause the patient to become allergic. The bacterial type of asthma is relatively rare in

\* The writer reiterates here what he said in the first paper on Asthma in Children, viz., that only those cases are asthma in which renal, cardiac, thymic asthma, and asthma due to enlargement of the bronchial glands have been excluded.



childhood (the writer's tests so far have all been negative), and more common in the adult.

There is yet another group of cases which give negative skin tests, and in which no etiological cause for the asthma can be found. The explanation may be that either the materials used in the tests were not concentrated or strong enough, or the proper materials were not selected, or that there is still another type of asthma.

The writer has followed forty-five cases of asthma in childhood over a period of several years. Five of these cases gave a history of egg idiosyncrasy, but have outgrown the idiosyncrasy and asthma without treatment, and are thus consistent with the general opinion in text-books, that children are apt to outgrow asthma.

During the course of the past three years the methods of determining the etiological cause of asthma have improved both in the technique and in the materials used in the tests. The skin test is performed as follows: A linear scarification is made about one-half an inch long, and only deep enough to penetrate the outer layers of the skin, care being taken not to draw the blood. In each case an extra scarification is made as a control, because it is a well-established fact that the mechanical injury to the skin may result in a pseudo-reaction (an elevated white area surrounded by a small roseola), especially in patients with an "exudative diathesis."<sup>14</sup> The scarifications† are then inoculated by placing the materials to be tested (preferably in fresh solution) on the scarifications, and watching them for twenty minutes. A positive reaction appears in from two to ten minutes, and in rare instances a delayed reaction is seen in one to two hours. A positive reaction gives an urticarial wheal with an irregular outline surrounded by a pink blush, both of these phenomena being absent in the control. In some cases the blush, without the urticarial wheal, is so pronounced that there is no question that there is a positive reaction. Itching may or may not be present. The reaction usually disappears within one-half to two hours. The more delicate the skin the more sensitive it is to a foreign protein, and the more readily will it react even when it is unbroken or only slightly broken. The skin of an infant reacts very readily, and even when healthy is capable of absorbing the foreign protein in some instances. When the skin becomes thicker and hardened by exposure, as in the male adult, it reacts less readily, requires a more concentrated test solution, and a deeper scarification. Children and young women with delicate skins react almost as easily as do infants. The skin of the inner

flexor surface of the arm is thinner and more sensitive than that of the outer arm, and for that reason is the best place to make the scarifications.

The materials used in the skin tests were at first watery extracts of cereals, and expressed juices (whenever they could be obtained), and were prepared freshly in the office. Later the pure proteins of various vegetables, fruits, and nuts were prepared by Mr. Wodehouse working in the Botanic Garden at Harvard College, and found to be more satisfactory than the home-made product. They contain a more concentrated solution and do not deteriorate. Naturally, the scope of this investigation increased with the number of materials which could be tested, and the thoroughness with which the cases were studied increased with the materials prepared for the tests.

Of the 45 cases in this series there were thirteen in which the skin tests gave no clue to the etiological cause of the asthma. They were either not tested with the proper material or they were anti-anaphylactic.<sup>15</sup> The difficulty of finding the cause of the asthma is shown by a case in which 38 tests were made before positive information was obtained.

Twenty-three cases of the series have been carefully studied, and of these 18 had eczema at some time or other. This is a higher proportion than that reported by Berkhard,<sup>16</sup> who found that in 117 cases, 44 had eczema simultaneously. A family history of asthma, hay fever, rose colds, eczema, or idiosyncrasy to some food was present in 19 out of the 23 cases, while in the remaining four cases there were no notes, in the family history, on these points. Berkhard also found a "hereditary element" strongly marked in 16% of his cases. It seems, therefore, that there is a strong family predisposition to asthma.

In 19 of the 23 cases selected from this series there was a positive skin test to fresh egg albumen.

Out of the total 45 cases the following positive skin tests were obtained:

Eggs .....	27
Beef juice.....	5
Rice flour (crude) (a).....	2
Oatmeal flour (crude) (a).....	2
Green pea (crude) (a).....	1
Kidney bean (crude) (a).....	1
Lima bean (crude) (a).....	1
Black bean (crude) (a).....	1
California pea bean (crude) (a).....	1
Dry cow casein.....	1
and questionable reactions.....	3
Raw cow's milk.....	1
Rice protein (b).....	2
Banana protein (b).....	1
Cocoa protein (b).....	1
Watery extract of orange (b).....	1
Almond protein (b).....	2
Almond (crude) (a).....	4
Brazil nut protein (b).....	2
Brazil nut (crude) (a).....	3
Walnut protein (b).....	3
Walnut (crude) (a).....	5

† There is still some doubt as to whether the scarification or the intracutaneous test is the best. There are two points in favor of the use of the scarification test,—its simplicity and the difficulty of interpreting the intracutaneous reactions in some instances. It is probable that the intracutaneous test is the more delicate, as shown by Blackfan. The writer's experiences do not justify the conclusions of Stickler and Goldberg (*Jour. Amer. Med. Assn.*, 1916, lxxvi, 246), who considered the reactions positive only when the erythema persisted for 48 hours.



Pean (crude).....	3
Castana (crude) (c).....	2
Protoid (crude) (c)*.....	1
Hazel nut (crude) (c).....	1
Peanut (crude) (a).....	1
Potato protein (b).....	2
Barley protein (b).....	1
Wheat protein (b).....	6
Whole wheat flour (crude) (a).....	4
Oat protein (b).....	2
12% alc. sol. cat's hair.....	2
" " " dog's hair.....	3
" " " donkey hair.....	3
Horse keratin.....	7
" serum.....	5

(a) Crude in this table means that the fresh flour was dissolved as much as possible in cold sterile water or normal salt solution and applied without filtering.

(b) Protein = the protein supplied by Mr. Wodehouse.

(c) In the crude preparation of nuts, the nut was broken, squeezed and some of the expressed fluid placed on the scarification.

\* Pinus ebulis imported from the southern coast of Italy.

It was found that one individual was apt to react to more than one form of protein, as shown in the case of a child who reacted to egg, lima beans, rice, green split pea, protoid nut, whole wheat, kidney bean, and California pea bean.

The frequency of positive reactions is illustrated by the following figures:

- 6 cases gave only 1 positive skin reaction to different materials.
- 4 cases gave only 2 positive skin reactions to different materials.
- 1 case gave only 3 positive skin reactions to different materials.
- 5 cases gave only 4 positive skin reactions to different materials.
- 2 cases gave only 5 positive skin reactions to different materials.
- 1 case gave only 7 positive skin reactions to different materials.
- 2 cases gave only 8 positive skin reactions to different materials.
- 1 case gave only 9 positive skin reactions to different materials.
- 1 case gave only 10 positive skin reactions to different materials.

It is still too early to say whether all of the positive reactions are of equal clinical importance, but experience seems to show that the severity of the symptoms is not always indicated by the size and character of the reaction. If an individual reacts to one kind of nut he probably will give a skin test to all nuts, except the roasted peanut,\* which is a lentil. It has been found, however, that the severity of the reaction may vary, as, for example, one case which had a marked reaction to the protein of the almond and only a moderate reaction to that of the walnut and Brazil nut. This difference in the reaction may be explained by the difference in the family of the nut. In the same manner, an individual who reacts to the egg of the hen also reacts to the egg of the duck, turkey, buff cochin bantam, English pheasant, pearl guinea hen, Japanese silkie and pigeon. The reaction is, therefore, to the egg and not to the species of the bird. The yolk and the white

\* The heat of roasting the peanut may make it suitable for sensitive individuals.

of the egg each react, but the white usually reacts more strongly than the yolk.

Experience has shown that when a positive skin test is obtained for a food, and the food is then removed from the diet, the general condition of the patient almost invariably improves, and in many instances a cure results. In other instances it is necessary to induce an artificial immunity because of the difficulty in entirely eliminating the offending protein from the diet, as, for example, eggs or milk. Immunity may be induced in these patients by giving increasing doses of the offending protein as described by Schloss.<sup>17</sup>

#### CONCLUSION.

A definite etiological connection may be established between most cases of asthma and some foreign protein by the skin test. If an individual is sensitive to one protein he is also apt to be sensitive to other proteins. The large number of cases with family histories of asthma or food idiosyncrasies makes it seem probable that there is a hereditary predisposition to sensitization. Information given by the skin test is of inestimable value in outlining the treatment of the case, and with the use of this information, marked improvement or cure often follows. Further study will undoubtedly add much to our knowledge of asthma and its allied diseases and will still further modify our conception of the processes involved.

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- Karasawa: Zeitschr. f. Immunitätsforsch. u. exper. Therap., Orig. 1910, v, 509, was able to produce anaphylaxis with extracts of beans, peas, lentils, rice, sago and wheat.

## PREPARATION OF VEGETABLE FOOD PROTEINS FOR ANAPHYLACTIC TESTS.

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IN studying the sensitization to various food proteins which results in asthma, eczema, etc., investigators have for the most part used a watery extract or the foods themselves to make the tests. This method, besides being clumsy, has obvious disadvantages, for it is desirable that the proteins of the vegetable foods to be studied should be as concentrated and in a form as easily handled as possible. Chappell ('15), in his studies on asthma, used concentrated extracts of strawberries and tomatoes, prepared by precipitating the watery extract with alcohol, for making the tests.

In the winter of 1915 the writer, without attempting to find out exactly which proteins in the foods were responsible for the biological reactions, endeavored to find a method of concentrating them all together in such a form that they would keep and be easily available for making tests.

It was found that an extract made with pure water would give just as powerful reactions as one obtained by any other solvent, thereby showing that the anaphylactogenic protein is water-soluble or at least soluble in water plus the salts contained in the food. Throughout the subsequent work water was used for extraction. As the work progressed, some of the studies of Dr. J. L. Goodale (as yet unpublished) showed that, as a general rule, vegetable foods, boiled, or moderately cooked in any way, furnished just as powerful anaphylactogens as the corresponding raw foods, thus eliminating, in these, all heat coagulable proteins as possible anaphylactogenic factors. From then on, the watery extracts were prepared from cooked foods, because cooking facilitates the extraction. In the case of the fruits, however, this is not so, for the weight of evidence seems to show that heating destroys their anaphylactogenic properties.

It can readily be seen that no one method could be found which was applicable to all

cases. Indeed it was necessary to study each case separately in order to get the best results; but in general the method employed was to soak the material in as large a volume as necessary (often as much as seven or eight liters to four or five pounds) for several days, using thymol as preservative. After decanting and filtering, the volume was reduced by evaporating before the electric fan at room temperature until the substance became syrupy or gummy. When possible (in only two cases) it was spread on paraffin plates and dried over sulphuric acid, and when thoroughly dry was pulverized in a mortar. Ordinarily, however, it was impossible to evaporate to complete dryness, even by the aid of a desiccator and exhaust pump or by digesting in absolute alcohol, for no matter what the process the product was always a thick gum. So after evaporation the substance was dissolved in sufficient water (as determined by preliminary tests) and precipitated by three or four volumes of 95% alcohol. The precipitate was then centrifugized out and washed through several baths of 95% alcohol, absolute alcohol, and then ether, and finally dried over sulphuric acid. In this way a friable powder was obtained, usually white or still retaining slightly the original color of the vegetable from which it was produced.

It was frequently necessary to deviate from this general plan. For example, it was often advantageous to precipitate with a mixture of acetone and ether instead of with 95% alcohol. When this was done the precipitate was put through two or three baths of this acetone ether mixture, then through ether, and the drying completed over sulphuric acid. It was found also that after precipitating with 95% alcohol the acetone ether mixture could be substituted for absolute alcohol in the dehydration process, the only advantage being that it is rather less expensive.

The powder obtained by this method is not always completely soluble in cold water, though in most cases it goes almost entirely into solution, giving a suspensoid or an opalescent solution. However, if the process of dehydration is delayed and the alcohol left on the precipitate for any length of time the precipitate becomes almost completely insoluble. In consequence, the process, from the precipitation with 95% alcohol, on to the drying in the desiccator, must be hurried over as rapidly as possible. For this reason the precipitates were centrifugized in preference to filtration. If, in spite of all precautions, they become only incompletely soluble in water, they can always be dissolved in weak alkali (about 0.1% KOH), and it has been shown that this strength of alkali does not affect the biological reaction.

For the sake of convenience the preparations made by this method may be classified as follows:



I. CEREALS.	IV. ROOTS AND TUBERS.
Barley	Potatoes
Wheat	Boiled potatoes
Wheat bread	Baked potatoes
Rye	Carrots
Corn	Turnips
Rice	Beets
Oats	Parsnips
	Squash
II. NUTS.	V. FRUITS.
Almonds	Apples
Brazil nuts	Oranges
Walnuts	Bananas
III. OTHER SEEDS.	VI. LEAVES AND STEMS.
Peas	Spinach
Boiled peas	Celery
Beans	
Cocoon	

I. *Cereals*: All except rice and oats were treated as described above, and a white powder was obtained almost completely soluble in pure water. It was found that rice and oats could be thoroughly dried on paraffin plates without the use of alcohol or acetone. While the rice preparation could be easily powdered and was completely soluble in cold water, giving an opalescent solution, the oat preparation came out in sheets, not unlike the commercial preparations of gelatin in appearance, and was entirely insoluble in cold water, but would dissolve completely in hot.

The chemical tests showed that in all cases these precipitates were made up largely of protein matter, but in most cases the heat-coagulable proteins were present in small amounts only, the bulk being made up of "proteose" and peptone. Subsequent experiments by the author (unpublished) have shown that, of the two proteoses that can be obtained from wheat flour, one, the natural "proteose" of Osborne ('07, '09) is anaphylactogenic to wheat-asthmatics, while the other, the artificial proteose, obtained by decomposition of the other proteins, is non-anaphylactogenic (cf. also Wells and Osborne, '14, '15).

II. *Nuts*: The large amount of oil present in these nuts was removed by first pressing in a screw-press until no more could be thus removed, then washing through three or four baths of carbon tetrachloride. After the oil was entirely removed and the carbon tetrachloride evaporated off, the resulting meal was treated as indicated above; and in all cases a fine, slightly colored powder was obtained, perfectly soluble. In the case of almonds and Brazil nuts, it was shown by chemical tests to consist largely of protein, but in the case of walnuts the amount of protein was small.

III. *Other Seeds*: Extracts of these are easily precipitated by 95% alcohol, and upon drying a fairly soluble powder is obtained. Chemical tests showed this in all cases to consist largely of protein matter. In the preparation from raw peas an albumin and a proteose could be detected, while in that from boiled peas only a proteose-like body was present.

IV. *Roots and Tubers*: In making these preparations the vegetables were boiled until soft, when they were triturated in the boiling water, plus enough water to make about a liter to .45 kilos, and then allowed to soak for several days. The preparation from raw potatoes was made by grinding up in a meat chopper and allowing to soak in cold water for several days, and the process completed as described above. During the extraction and evaporation, however, the material became jet black, owing to the oxidation of chromogen, and this cannot be removed from the finished product. This difficulty is avoided, however, by using boiled or baked potatoes, because the heating destroys the oxidase, which is the active agent in the oxidation.

Chemical tests show that there is really only a very small amount of protein present in these preparations. The one from raw potatoes showed the presence of a heat-coagulable albumin-like substance and traces of a protein not coagulated by heat, probably the proteose described by Osborne ('96). The cooked potato showed the presence of a proteose or some proteose-like body. The carrot preparation also showed the presence of a proteose-like substance, but in the others no protein could be demonstrated by chemical means.

V. *Fruits*: Great difficulty was experienced here in getting the water-soluble part to precipitate. In the case of bananas, if slightly over-ripe fruit is used, the extract can be made and precipitated in the usual way; but if ripe or under-ripe fruit is used, the ordinary protein precipitants cause a gelatinization of the pectose, which renders it impossible to handle. This same difficulty was experienced with apples and oranges, from which, on this account, no good dry preparation has, as yet, been obtained. At the time of writing these two are still under investigation.

VI. *Leaves and Stems*: These preparations are easily made by the ordinary method. However, in none has any protein been detected by chemical means.

From the foregoing work it was found possible to prepare concentrated watery extracts from all the vegetable foods which are ordinarily responsible for anaphylactic diseases, and put them into an easily available form for making tests.

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## THE NORMAL REACTION OF THE SKIN TO STROKING.\*

### A DESCRIPTION OF THE PHENOMENON, AND AN EXPLANATION OF ITS CAUSATION BASED ON REASON AND EXPERIMENT.

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THE deduction that the phenomenon here described is the normal reaction of the skin to a mechanical irritant is based on the fact that it was observed in 1165 out of 1236 individuals examined. Their ages ranged from six days to 83 years. As there were known disease conditions present in the majority of the remaining cases, it strengthens the deduction that the phenomenon under consideration is the normal reaction.

The phenomenon in brief is this: When the skin of a normal quiescent subject is stroked by a wooden instrument (e.g. a wooden tongue depressor or a match) it reacts by a deepening of the skin tint, generally brief in duration, appearing where the stroke was made, or in its immediate vicinity, and then, after a period of about fifteen seconds, by a longer lasting whitish color (in Caucasians), showing itself in the location where the stroke was made. The reaction is seen most clearly when the test is made for it on the rosy cheek of a healthy Caucasian boy or girl. The cheek is stroked across, lightly, once; its tint where stroked is soon seen to deepen, and, after a while, fifteen or more seconds, a pallor takes the place of the redness, the streak of white being very noticeable because of its contrast with the rosy field on which it is displayed. The normal reaction just described consists then of two components, the one, vaso-dilation, and the other, vaso-constriction.

### THE CAUSATION OF THE ABOVE-NOTED PHENOMENON.

Besides the normal reaction described, and consisting of two components—vaso-dilation and vaso-constriction, reactions were obtained in subjects in which one of the components was absent; that is, cases were tested in which no vaso-dilation occurred, the vaso-constriction component being present alone in response to the testing stroke, and other cases were tested in which the vaso-dilation component alone was present.

There must be some cause or causes for such various reactions to the same irritant.

It is assumed that the reactions of vaso-dilation and vaso-constriction of the blood vessels of the skin, originate in nerve stimulation caused by the mechanical irritation of stroking.

To produce the reaction a nerve mechanism is assumed for the reacting blood vessels, similar to that given graphically by Rudzki-Hornowski,<sup>1</sup> and based on the work of Ranvier, Schiff and

Gianuzzi; their diagram illustrating the connection of the local fibrils and ganglia of the sympathetic nerves with the blood vessels at the periphery. It is assumed that this is modified somewhat to allow for a connection with the sensory filaments of the skin, and with the autonomic nerve fibres, that are assumed to be in all of the integument as they are known to be in the integument of the face. This latter connection permits of central stimulation of the mechanism of vaso-dilation.

It is assumed that fibres from both branches of the vegetative nervous system,—the autonomic and the sympathetic,—such as are described by Rudzki-Hornowski<sup>2</sup> as an actuality for the sympathetic system, reach into the intima of the blood vessels.

Now the nerve mechanism, whatever it may be, is manifestly the same in all the subjects tested. One thing, however, reached by this mechanism—the blood—is all important, and it is assumed to be a part of the mechanism concerned in the phenomenon observed. The fact that the sympathetic nerve fibrils reach into the intima, that is, that the nerve mechanism of vaso-constriction is known to come into contact with the blood, is a basis for assuming the blood to be a part of the mechanism. It is thus considered a physical part of the mechanism, just as the vessel's walls are, both being in intimate contact with the nerve fibrils which communicate with near-by ganglia.

As has been said, the nerve mechanism is manifestly the same in all the subjects tested. There is one element in the assumed mechanism, however, that is changeful in every case tested, and that element is the blood continually flowing through the vessels and bathing the ends of the vaso-motor nerves in the intima of the vessels. Besides changing constantly its position, it is changeful in composition, carrying the hormones, activators to various organs, and also the various products of metabolism. It is natural therefore, to look to the blood—the only changeful element in the mechanism under consideration—for a solution of the riddle of the reactions found to occur,—the reaction of vaso-dilation followed by vaso-constriction, as the result of a single stroke irritation, the reaction of vaso-dilation alone in some cases, and the reaction of vaso-constriction alone in other cases.

Mention has been made of the fact that hormones, activity incitors, are carried in the blood stream. These are substances given to the blood streams by the endocrine glands. They are less complex than albumen, and capable of ready osmosis through animal membrane.

We know that adrenalin, one of them, is an activator of sympathetic mechanisms. Polak,<sup>3</sup> from his experiments on glycosuria production, concluded that adrenalin works by acting on the peripheral endings of the sympathetic. We know that this hormone is being constantly supplied to the blood stream.

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I have observed, after the therapeutic injection of adrenalin in cases in which, before the administration of it, the vaso-constriction component of the normal reaction to stroking was absent, that after about five minutes, on testing, the vaso-constriction component appeared. This can be explained only by the adrenalin added to the blood stream activating the vaso-constriction mechanism by acting on the peripheral endings of the sympathetic nerve in the intima, its activation being evoked by the irritation of stroking. Here, by direct experiment, Polak's deduction that adrenalin acts on the nerve-endings of the sympathetic is visibly verified.

Thus we have one hormone, adrenalin, with a known incitor action of the mechanism of vaso-constriction. But the phenomenon cannot be explained by this hormone alone. We are obliged to assume the presence of at least two hormones in the blood to produce the three reactions that have been observed: 1, vaso-dilation, brief, followed by a slow-coming vaso-constriction that is comparatively long lasting—the normal reaction; 2, the reaction observed in which vaso-dilation alone occurs; and 3, the reaction observed in which vaso-constriction alone occurs.

We cannot suppose the activation of these reactions to be due to the known hormone adrenalin alone, its presence causing its known action of vaso-constriction on the vaso-motor mechanism and its absence causing vaso-dilation to occur; that would account for but two of the reactions noted above, leaving unexplained the normal reaction, the one most frequently observed,—the reaction of brief vaso-dilation followed by slow and long-lasting vaso-constriction sequential to a single stroke of mechanical irritation.

Therefore two hormones at least are necessary for the causation of the phenomena observed.

Moreover, to explain the phenomena, a nerve mechanism for vaso-dilation is necessary, together with the one generally allowed to exist for vaso-constriction. In other words, the vaso-dilation observed is not due to a mere temporary paralysis of the vaso-constriction mechanism. Let us assume that there is only one nerve mechanism,—the known one of vaso-constriction. It has already been shown that two hormones are necessary to explain the phenomena observed. If both hormones are present in the blood of the vessels and activate the same nerve mechanism, it is difficult to see how the normal reaction could occur unless we assume that the paralyzing hormone acts for a brief time only, being always overcome by the activation of the adrenalin on the mechanism. In the absence of adrenalin, the activation of the paralyzing hormone, evoked by irritant or stimulus, could be long lasting, and account for the sole vaso-dilation reaction to the irritant stroking sometimes observed. But the assumption that there is only one nerve mechanism—the sympathetic—would

not allow for the central origin of stimuli to produce vaso-dilation, because experimental central irritation of the sympathetic fibres never produces vaso-dilation; that is, central stimulation or irritation of the sympathetic fibres always activates the mechanism only in one way, that of vaso-constriction.

Hence the activation of vaso-dilation by central stimulation requires a nerve mechanism for its production independent of the sympathetic mechanism.

If, however, we assume a double nerve mechanism connected with the blood vessels in the skin to be present, a ready explanation of all the phenomena observed is offered.

With a double nerve mechanism we can understand how both could be activated by a single stroke of mechanical irritation. In the presence of the incitor hormones,—hormone X for vaso-dilation, and hormone adrenalin for vaso-constriction,—both nerve mechanisms could be activated at once, and quick and brief vaso-dilation, and slow and long-lasting vaso-constriction occur. If the hormone X—incitor of vaso-dilation—were present alone we should have a strong vaso-dilation reaction as a result of the stroke of irritation. If the hormone adrenalin—incitor of vaso-constriction—alone were present, we should obtain activation of the vaso-constrictors and it would be long lasting.

Such are the phenomena observed, and it appears rational to predicate a double nerve mechanism, one for vaso-dilation and one for vaso-constriction. Otherwise, as has been shown, the normal reaction observed and described cannot be explained.

This theory of a double nerve mechanism of the peripheral blood vessels is also in accord with the facts of central stimulation of certain autonomic nerve fibres causing vaso-dilation of the face, and central stimulation of the cervical sympathetic, causing vaso-constriction of the same region.

As corroborative of this theory of a double nerve mechanism for the blood vessels of the skin, I regard the observations of Meltzer,<sup>4</sup> who noted that stimulation of the vagus [autonomic] produces only a brief after-effect, while stimulation of the accelerator nerve [sympathetic] leaves a long-lasting after-effect. In the phenomenon of the normal reaction described—the vaso-dilation, assumed to be due to stimulation of autonomic fibres, is of brief duration; and the vaso-constriction, due to stimulation of the sympathetic, is long lasting.

As further corroboration of this theory of a double nerve mechanism of the blood vessels of the skin, I here report an experiment of injecting pilocarpine into the skin. Eppinger and Hess,<sup>5</sup> together with other German investigators, have found this drug to be the analogue of the physiological hormone X (or "autonomyn" as they term the hormone) as an incitor or activator of the autonomic nervous system only.



The injection of pilocarpine into the skin was followed by quick vaso-dilation locally and the production of a wheal formation apparently identical with *urticaria factitia*. In other words, pilocarpine, a known activator of autonomic nerve mechanisms, activates a nerve mechanism in the skin that is not the sympathetic mechanism.\* The conclusion is it must be the autonomic nerve mechanism really present in the skin. I have already described an original experiment demonstrating that adrenalin activates the sympathetic nerve mechanism of the blood vessels of the skin.

To recapitulate briefly: The phenomenon observed and here reported of the normal reaction of the skin to mechanical irritation produced by stroking with a wooden instrument, and consisting of vaso-dilation, brief in duration, followed by vaso-constriction, long lasting, the writer holds is caused by a double nerve mechanism, one for vaso-dilation (autonomic) and one for vaso-constriction (sympathetic); together with at least two hormones in the blood stream, the hormone X (Eppinger and Hess' "autonym") activating the vaso-dilation mechanism; the other hormone, adrenalin (or analogue, inciters of sympathetic nerve endings), activating the vaso-constriction nerve mechanism.

#### COROLLARY.

The clinical examination of a patient should include testing for the above described reaction. If both components of the reaction are present, the normal reaction, we know then that the hormones activating the autonomic and sympathetic branches of the vegetative or visceral nervous system are present in the blood. If the vaso-dilation component alone is present we know that the hormone X, or analogues, are in excess in the blood, or that the hormone adrenalin (or pituitrin with analogous action), is in insufficient amount to activate the sympathetic nerve endings in the blood vessels tested. If the vaso-constriction component alone be present, we know that the hormone adrenalin (or analogue) is present in excess in the blood, or the hormone X, or analogues, are present in insufficient quantity to activate the autonomic fibrils in the blood vessels.

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- <sup>2</sup> Higier: Ergebnisse der Neurologie und Psychiatrie, Zweites Band, 1912, p. 129.
- <sup>3</sup> Higier: *Ibid.*, p. 149.
- <sup>4</sup> Meltzer: Journal of the American Medical Association, 1916, No. 12, p. 931.

\* The vaso-dilation caused by the pilocarpine is not due to paralysis of the vaso-constriction mechanism, because stroking (with a blunt pin) results in a streak of vaso-constriction in the reddened area.

## PROTEIN EXTRACTS IN STATES OF HYPERSENSITIZATION.

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ANDERSON and ROSENAU in their Harvey lecture define hypersusceptibility as a condition of unusual or exaggerated supersensitiveness of the organism to foreign substances. The term anaphylaxis is similarly used. Numerous observations, extending over a period of years, have been made both on animals and human subjects in regard to the supersensitive state and its relation to various foreign substances.

Clinically, one of the best known examples of anaphylaxis is the hypersusceptibility to pollen showing itself as hay fever. The reactions produced by tuberculin and mallein in suitable individuals are well recognized examples of this phenomenon.

More recently, as the result of much clinical and laboratory work, certain other clinical conditions have lately been grouped as anaphylactic states, notably poisoning following the ingestion of strawberries, fish or eggs, and showing itself by gastro-intestinal manifestations.

In like manner, also, not only the well recognized pollen fever, but rose cold and the condition known as bronchial asthma, come under this head. This latter clinical entity differs somewhat from other hypersensitive states in that there may be several sensitizing factors present playing a definite part in the production of the disease; so that at the present time it would seem possible not only to have various food products playing a part, but also numerous bacterial proteins.

Von Pirquet, from his study of vaccinia and the local reaction produced by the injection of tuberculin, showed that sensitization could be estimated from the local phenomena taking place about the point of inoculation.

Since the development of the so-called von Pirquet test for tuberculosis this method is now extensively used to test states of hypersensitization to various proteins, bacterial and otherwise. While other methods, such as the eye reaction of Calmette in tuberculosis and the use of products of autolysis of the typhoid bacillus distilled into the eye to detect typhoid fever, have been extensively used, for all practical purposes the simpler cutaneous test is the most practical method.

To carry out this test for the detection of hypersusceptibility towards various proteins the preparation of extracts is of considerable importance. In order to get the best results it is essential that the preparations used should readily be held in suspension, should be sterile and should be suspended in a non-irritating and readily absorbable diluent. Where bacterial proteins are under consideration, pure cultures must be secured, free from the media



used, and identification, not only of the type, but of the group of organisms to which they belong, should be complete.

In attempting to devise a method to prepare protein extracts from bacteria or foods, many difficulties have arisen. The first obvious step, however, was to avoid the use of chemicals which would neither form insoluble compounds with the protein present, nor form compounds which might lead to erroneous results. Furthermore, the use of excessive heat may to a considerable degree impair the solubility of some proteins. Desiccation to dryness of a substance requires a considerable period of time, and the use of various extractives offers the opportunity for more or less modification of the material from its original composition.

The following methods have been used:

The frequency with which local reactions take place at the point of inoculation in the use of bacterial vaccines at once suggested the method of Wright as one which could be employed in this work.

Various bacteria grown in pure culture in abundance were suspended in normal salt solution and killed by 60° of heat for 30 minutes. Heavy suspensions were then used to detect sensitization. This method, while simple and relatively quickly carried out, has the objections that the final product is inconstant in its concentration, and the prolonged action of heat may materially modify the protein to be tested.

A second method was that of securing a heavy suspension of a bacterial growth, or of food, in salt solution, centrifuging to produce concentration, and then obtaining the substance, bacterial or otherwise, in a dry form by successive washings with alcohol and ether. A suspension of 5 mg. of the residue in one cc. of 15% alcohol was then prepared. The comparison of these suspensions with others later used showed that these preparations were less soluble and reactions were less readily obtained.

Several modifications of this method were carried out, such as the addition of acetone to the original solution to throw down the suspended protein; the use of 0.5% solution of phenol with  $\frac{1}{20}$  normal sodic hydrate as solvents to the precipitated protein; and the autolysis of various bacterial suspensions under ether vapor, followed by extraction with alcohol and ether. The direct application of the resulting powder to the skin was then made.

All these methods were found to be unsatisfactory in that the extracted protein gave unreliable results or failed to show a reaction where sensitization was known to be present.

The above methods, though unsatisfactory, clearly demonstrated the necessity of obtaining the protein extract in a soluble form and of such strength as to render it possible to show a cutaneous reaction, where food or bacterial sensitization is present.

On account of the great variety of food

products which may give rise to sensitization, some variation in their preparation is necessary. In general the following method is equally applicable to both food and bacterial preparations.

The material to be used is secured in large quantities and suspended in normal salt solution with 0.5% phenol added. A bacterial suspension is autolyzed at a temperature of 48° for 24 to 72 hours, depending upon the organism in suspension. During this process the cellular structure of the organism is more or less completely broken down.

The suspension, immediately following the period of autolysis, is quickly evaporated to dryness by a constant temperature of 40°, thus favoring the reduction of the protein to a soluble form. This latter step is carried out by the following simple device. The suspension to be evaporated (this applies to all protein extracts) is placed in flat bottomed glass dish, over a water bath, with an air current from an electric fan directed over the suspension. The flame under the water bath is protected by a shield to prevent variations of temperature. By this simple device the temperature remains constant and quick evaporation to dryness is obtained.

The evaporated material is collected and is kept free from contamination by immediately transferring the preparation to sterile glass-stoppered bottles and sealed. For testing purposes the powdered extract is ground up with glycerine in the proportion of 10 mg. of the powder to 1 cc. of glycerine. One to two drops of this preparation are used for a test. If the powder is applied to the skin directly a constant standard cannot be established or a sterile preparation cannot be vouched for. The glycerinated preparation insures, with ordinary care, a sterile preparation and a constant strength, thus establishing a standard.

The test is carried out in a similar way to the von Pirquet tuberculin test. The inner side of the forearm is cleaned with alcohol and ether, and two scarifications or similar scratches are made about three inches apart, allowing the oozing of serum only. On one spot or scratch one or two drops of the extract are placed and allowed to soak in. The other spot is kept as a control. Both spots should be examined at intervals of twenty minutes, half an hour and one hour. In many cases the food extracts give quicker reactions than the bacterial extracts. Positive reactions consist of a raised urticarial wheal, surrounded by an area of redness of the skin, somewhat circular in outline and usually from 2 to 7 mm. in diameter.

The possibilities of such a method to determine hypersensitization are far reaching. For example, in such a condition as bronchial asthma, one or more factors may play a part in the sensitization so that a large series of tests may be necessary in order to determine all the factors involved. A detailed history is essential as



well as various skin tests with pollens, food and bacterial extracts. Some such outline as is given below may help to bring out many of the factors concerned in a complicated case.

## CHART.

Symptoms following:

## (a) Inhalation of:

1. Grasses, ragweed, goldenrod, asters, etc.
2. Animal products of: horse, cat, guinea pig, etc.
3. Chemicals, dyes, dust.

## (b) Ingestion of:

1. Grains.
2. Nuts.
3. Fruits.
4. Molluscs.
5. Meats.
6. Milk.
7. Eggs.
8. Fish.

## (c) Infection with:

1. Staphylococcus group.—aureus, albus citreus.
2. Streptococcus group.—Pyogenes, fecalis, anginosus.
3. Pneumococcus group, types 1, 2, 3, 4.
4. Diphtheroid group.
5. Bacillus influenzae.
6. Micrococcus catarrhalis.
7. Friedlaender group.
8. Bacillus ozaenae.

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## Clinical Department.

## HAY-FEVER: ITS TREATMENT WITH AUTOGENOUS VACCINES AND POLLEN EXTRACT.

By LEON S. MEDALLA, M.D., BOSTON.

## INTRODUCTION.

This paper is a report of six cases of hay-fever (5 autumnal and 1 June hay-fever) treated with autogenous vaccines. The symptoms in the autumnal cases usually began about the middle of August and would last until late

in November, being relieved after the second or third heavy frost. Five of the six cases have been seen by me for the first time during the attack last year, while the sixth I had under observation since 1911, at which time she applied for treatment for alveolar osteomyelitis or "pyorrhea." The treatment and relief from the hay-fever in this last case was incidental. The extent of time this patient was under observation (5 years) is of value in the discussion of a seasonal disease such as hay-fever.

## ETIOLOGY.

Pollenosis as being the direct exciting cause of this disease is by this time fairly well established. The direct production of typical attacks of hay-fever at any season of the year by having the patient inhale pollen, as reported by Scheppegegrell,<sup>1</sup> is in my opinion more valuable as a means of establishing the etiologic relation of pollenosis to this disease as well as a means of diagnosis than the cutaneous reactions so extensively carried on by Goodale<sup>2</sup> for almost any kind and variety of proteins.

The specificity of intradermal and cutaneous reactions has been greatly undermined by the work of numerous investigators as quoted in two recent articles by Stokes<sup>3</sup> and by the investigations carried out by Stokes himself.\*

The subject of cutaneous reactions is a very complex one, and really embraces the whole problem of the physical mechanism of anaphylaxis, and is entirely beyond the scope of this paper. That much is, I believe, sufficient for our purpose;—that these cutaneous reactions are not due to any specific antigen-antibody reaction; they can be elicited by inert substances such as agar, bismuth subnitrate, etc., and are, therefore, of little diagnostic value.

The wholesale empirical application of the cutaneous tests or "skin scratches" in vaso-motor disturbances will prove, I believe, of very little value, if any, as a diagnostic measure. The attempt to substitute a cutaneous reaction, elicited by bacterial extracts,<sup>4</sup> for bacteriological and cultural findings seems to me entirely unwarranted, more especially in such cases where cultures are obtainable and the infecting organism easily determined.<sup>†</sup>

\* The mechanism of the cutaneous reaction is now held, by practically all investigators on the subject, to be due not so much to the substance introduced parenterally, as to the released elements normally present in the individuals—released by the adsorbing action on the anti-formers by the substance introduced parenterally. Whether the substance be ragweed extract, bacterial extracts, egg albumen, horse keratin, lutin, tuberculin or plain agar matters very little since "cutaneous" reactions can be obtained in apparently healthy individuals with any of the above-named substances for no apparent reason. Why such reactions should occur in some normal individuals and not in others has not been worked out as yet.

† Further investigations will, I believe, disclose that the reason for these skin reactions is due to the general hypersensitivity of the skin of these individuals, similar to the hypersensitivity of their mucous membranes associated with it, as well as a state of lowered coagulability of the blood. Thus the state of the individual, rather than the particular substance used in the test, will be the underlying factor.

The reaction to the bacterial extracts as described by Goodale,<sup>2</sup> lasting from  $\frac{1}{2}$  to 1 hour without going on to papule formation, is, I believe, no reaction at all, since the cutaneous tendency of the skin of such individuals may be sufficient cause for such a transient reaction caused by a "scratch" and the introduction of any substance that would act as an anti-former adsorbent.



The mechanism of the production of hay-fever in the light of these new developments concerning the physical mechanism of anaphylaxis could, therefore, be considered as being due to:

First. The pollen-albumens adsorbing the anti-ferments, thus allowing the natural ferments present in the nasal secretions, mucous membrane, lymph and blood to produce the anaphylatoxin, which, in turn, causes the well-known symptoms of hay-fever.

Second. The bacteria present in the nose are thus enabled to cause infection, aggravating and keeping up the condition which would otherwise have been a slight transient affair. I have already referred to a similar phenomenon in a previous article,<sup>5</sup> in connection with eczema, where the direct exciting etiologic factors responsible for what would otherwise be a *passing dermatitis* produce a true *eczema* because of the superimposed infection with the *staphylococcus aureus*.

Third. The lowered coagulability of the blood of the individual and the consequent dilated superficial capillaries make it easy for any substance to provoke anaphylactic symptoms.

The principal factor in the etiology, namely, pollenosis, is the most important exciting cause in this disease. I feel that only such pollens can produce the disease which, when lodged upon mucous membranes of susceptible individuals, are capable of being attacked and their albumens liberated by the secretions of such mucous membranes. The albumens thus set free adsorb the anti-ferments and allow the normally present ferments (when freed from the inhibitory action of the anti-ferments) to cause toxicity with the production of the well-known symptoms of hay-fever. The mechanism of the natural production of this disease—the adsorption of the anti-ferments—is the reason why one attack makes the individual more susceptible rather than immune to further attacks. For this reason no therapeutic immunization could be expected from the local inhalation of pollens, as Scheppегrell<sup>1</sup> reports having used, or from the subcutaneous administration of pollen extracts. No other more plausible explanation has as yet, in my opinion, been brought forward that would satisfactorily explain the symptom-complex of this disease.

The bacterial relation to this disease cannot be so easily put aside as Scheppегrell<sup>1</sup> would have us do. The constant presence of abundant *staphylococcus albus*, *aureus* or *citreus*, either alone or in combination, in the nose as well as in the conjunctival secretions, in all my patients who returned this year for prophylactic inoculations while in their normal state, is certainly of significance. The vast number of negative cultural findings of the nasal secretions I have personally obtained in patients who applied for various diseases, other than hay-fever, and without any nasal infection, makes me feel that there is a definite rela-

tion between the bacteria isolated from the nose and this disease.

It is true that the bacteria are there without causing the symptom-complex; they cannot, therefore, be referred to as the exciting cause of this disease; their presence, however, is abnormal, and may be the cause of the lowered local resistance preparatory to pollenosis. The bacteria and their products are also probably responsible for making it possible for the conjunctival and nasal secretions to attack the pollens, liberate their albumens and cause the disease.

Thus the presence of the bacteria and their products are, I believe, the deciding factors between an individual's being susceptible to the disease or not; while the superimposed infection which these bacteria cause, following the anaphylactic state (sneezing) due to the pollenosis is, I believe, responsible for the real symptoms of the disease, changing it from a mere transient sneezing spell to a real disease with considerable suffering.

I cannot explain in any other way the startling results obtained in this disease, by myself and by others as found in the literature, with the use of autogenous vaccines. The bacterial element in this disease is, therefore, I believe, of great importance.

The lowered coagulability of the blood is the principal reason why good results have been reported by the use of calcium chlorid in the disease under discussion. This drug, as is well known, raises the coagulability of the blood, making it considerably more difficult for the blood serum to ooze out from the capillaries upon the slightest provocation, as is the case otherwise.

#### BRIEF REVIEW OF THE LITERATURE.

I shall not enter upon a discussion of the results obtained by means of pollen extract or pollen serum administration in the various forms, as found in the literature. From our knowledge, as already referred to, of the mechanism underlying anaphylatoxin production and its consequent symptoms by means of the pollens, it would seem to me that theoretically no success could be hoped for from the pollen extract administration because the pollens produce in nature anaphylaxis and not infection followed by immunity, as bacteria do. Our present-day knowledge of the results of such treatment substantiates my contention. Thus Scheppегrell,<sup>6</sup> who was one of the first men in this country to use and report the pollen "immunizing treatment of hay-fever" in 1909, states in his latest article<sup>1</sup> (March, 1916) that the method was gradually discontinued. The only thing he has to offer, now, for this disease is the preventive treatment by means of the eradication of the various pollen-bearing weeds.

I shall now refer briefly to the results obtained with bacterial vaccines in the treatment



of this disease, as found in the literature. Farrington<sup>7</sup> reports 25 cases treated with autogenous vaccines made up from the bacterial growth obtained from the nose after the symptoms have developed. Out of the 25 patients thus treated, he reports 13 cured, 8 of whom were complicated with asthmatic attacks; 6 were markedly improved, 5 of whom had asthma; 3 slightly improved, all had asthma; and 3 failures, all had asthma. He concluded that "autogenous vaccine offers decidedly more in the treatment of hay-fever than all other methods combined."

Morrey<sup>8</sup> reported 8 cases treated with autogenous nose vaccine, with relief in all.

Strouse and Frank<sup>9</sup> report 13 cases (5 early June fever and 8 autumnal fever) treated with autogenous nose vaccine. Of the 5 with June fever, 2 were cured, 2 were slightly relieved, and 1 greatly relieved; of the 8 cases with autumnal hay-fever, 4 were greatly relieved, 2 relieved, and 2 no effect.

They report 3 cases that have been free from hay-fever until a hot spell in September, at which time these patients had a very severe attack. Most surprising results were obtained, they say, by the administration of autogenous vaccines, the symptoms almost completely disappearing following the first injection. A similar result was obtained in a fourth case. In all these four cases seasonal cures were obtained.

These authors conclude that, of the two methods of treatment, the autogenous vaccines seemed to have given "equal or better results in individual cases," as compared with the results obtained from the use of pollen extract.

#### PERSONAL WORK.

The cases I had under observation were all treated with autogenous vaccines obtained from the nose and throat. The cultures were obtained by passing a sterile swab along the floor of the nose to the posterior wall of the pharynx, being careful to swab off, in withdrawing, the mucous lining of as much of the passage as possible. Cultures are then made in the ordinary way on glucose agar, blood serum, bouillon and blood agar. Several tubes of glucose agar slants are used, sufficient for an auto-vaccine. Cultures are made in a similar way from the throat by swabbing off tonsils and going in as deeply as possible between the pillars of the fauces. Cultures from the eye conjunctiva are made by placing a swab on the cornea toward the inner canthus, covering it up with the lids and having the patient squeeze the lids tight,—the swabs soak in any of the secretion present,—then having the patient release the lids and the swab is removed. The growth, as a rule, was found sufficient at the end of 24 hours for the preparation of the autogenous vaccines,—which is carried out in the ordinary way.

Four of the cases were treated with pollen ex-

tract alongside of the autogenous vaccine. The results obtained, however, in the cases treated with the autogenous vaccine alone, as well as in the four cases treated by the combined method, from the way these same cases reacted to the autogenous vaccine prior to the use of the pollen extract, makes me feel that the pollen extract can be easily dispensed with.

Four of the autumnal cases were seen for the first time during the attack, while the fifth one came in three weeks prior to his usual time of attack. All the five cases with the autumnal fever have been relieved from the hay-fever by the autogenous vaccine for the first time in several years, and can be considered "seasonal cures."

The one early June fever (Case 1) I had under observation since March, 1911, and I believe it is the only case of hay-fever on record on whom autogenous vaccine has been used for that length of time.

The hay-fever in this case has always been accompanied by asthma and has been of over 20 years' standing. The relief in response to the autogenous vaccine was marked, necessitating two to three treatments each year, with no discomfort to the patient. She has had no asthma practically from the beginning of treatment, and with the exception of a slight transient attack of sneezing following a long auto trip, she has been free from hay-fever. She has had no recurrence this year (1916).

No pollen extract has been used in this case, nor did I feel justified in trying anything else, since her autogenous vaccine has given such good results.

This case has been the stimulus of my other cases, and although I have used, in some of the others, the pollen extract alongside of the autogenous vaccine, I feel that the latter is the more important therapeutic agent in this disease.

Probably the best way of presenting the results of this treatment will be by a brief résumé of each case history.

CASE 1. N. W. J. Female, 50 years, March 22, 1911.

*Family History.*—Mother had hay-fever; otherwise negative.

*Past History.*—Negative.

*Present Illness.*—Applied for treatment for advanced alveolar osteomyelitis (pyorrhea); has three loose teeth and lost several from looseness. Has hay-fever and asthma, which begins regularly in June and lasts, as a rule, for six weeks every year; has had it for over 20 years. Cultures from nose showed staphylococcus (weak) aureus. She received ten treatments with autogenous vaccine, ranging in doses from 150 to 200 million at an interval of 5 to 14 days. July, 1911, is feeling well; gums very much improved; "has had no hay-fever this year; is very much delighted over it."

Returned on May 28, 1912, with a slight sneezing attack; "feels hay-fever coming on"; was given an injection of vaccine on the same day and another one on June 8 and June 13; responded very well; hay-fever has not developed. Was again seen



on June 2, 1913, when she came in complaining of "hay-fever coming on following a long auto drive"; received a treatment the same day and another June 9; "has had no asthma the 17th of June, the first time in 20 years; has felt fine and free from hay-fever"; received another inoculation on June 24 and July 9. Was again seen on June 12, 1914, "slight sneezing and hay-fever coming on"; hay-fever has not developed much. Was again seen on June 14, 1915. "Has been free from hay-fever three weeks over this year. Just began to sneeze slightly"; otherwise well; was given 150 million autogenous vaccine. Another treatment on July 6 and July 14. Has been well since; free from hay-fever this year, 1916.

CASE 2. B. M. G., 49 years, male, merchant. July 23, 1915.

*Family History.*—Hay-fever and asthma on mother's side; has an uncle that is suffering from asthma.

*Past History.*—Has had all sorts of children's diseases; otherwise negative.

*Present Illness.*—Complains of hay-fever of 37 years' standing; begins as a rule on the 19th of August and lasts until after the second or third heavy frost, usually is suffering up to the end of November; has used pollantin, with no benefit; has had a variety of treatment by various physicians without any results. Cultures from nose showed staphylococcus aureus and albus. Throat cultures showed strepto-pneumo and M. catarrhalis. Autogenous vaccines were made from the nose and throat cultures. He was tested to daisy, tansy, goldenrod and ragweed; was found positive to goldenrod and negative to the others.

He received 12 injections of his autogenous—nose and throat—vaccines, ranging from 250 to 500 million, at an interval of 3 to 5 days. He also received four inoculations with goldenrod extract, beginning Sept. 11, alongside of the autogenous vaccines.

This patient, aside from a slight attack of sneezing following a long auto trip (on Sept. 1), was free from hay-fever for the first time in 37 years. He was discharged Oct. 9, 1915, feeling very happy over the results obtained with the autogenous vaccines. He is coming back the middle of July for prophylactic inoculations. This case can be considered a "seasonal cure." The four inoculations of goldenrod extract I do not believe had much influence upon the outcome.

CASE 3. K. F. C., 39 years; male; letter-carrier. August 23, 1915.

*Family History.*—Negative to hay-fever.

*Past History.*—Had scarlet fever when a child, accompanied by a serious eye trouble; got over it; has had no serious illness.

*Present Illness.*—Hay-fever and asthma of 22 years' standing; has had the hay-fever for about a week now; has had the asthma for a week previous to that; does not have asthma unless it comes with the hay-fever. Nose markedly swollen, completely clogging up passages; whole pharynx edematous and inflamed. Has had an operation on the nose some years ago, with no relief; was tested to ragweed, goldenrod and daisy; was found markedly

positive to ragweed and negative to the others. Cultures from nose showed a growth of an unidentified bacillus, and a diplococcus from which an autogenous vaccine was made up. He received 200 million of the autogenous vaccine on August 30; had a severe reaction following it; his asthma and hay-fever very much worse that night; was better the next day. Sept. 3 he received half of the previous dose, which was followed six days later by another dose similar to the first; three days after the third inoculation (Sept. 12) his hay-fever and asthma cleared up. He received four more prophylactic treatments at an interval of one and one-half to three weeks, and was discharged cured (Nov. 2) with directions to return next year, a month prior to the time when his hay-fever is due.

This patient was a great sufferer from the hay-fever and asthma,—the most pronounced case I have seen, of 22 years' duration. The way he responded to the autogenous vaccine cannot be emphasized too strongly. He received no ragweed pollen extract. He has been attending to his work all along throughout treatment, and although he has been exposed to considerable ragweed on vacant lots while delivering the mail on his tours, three or four times daily, he has not had any return of his trouble, and can be considered a "seasonal cure."

CASE 4. P. R. F.; age, 51 years; clergyman. Sept. 13, 1915.

*Family History.*—A brother has always had asthma and hay-fever in England; otherwise negative.

*Past History.*—Has been practically well all his life, except for "colds"; has had "continuous local treatment with some spray or other"; had a streptococcus sore throat about two years ago, which affected his leg, suffering considerably.

*Present Illness.*—Hay-fever, definitely pronounced for last three years; previous to that he thought it was just a "cold." Chief complaint is inflammation and itching sensation of the eyes; sneezes considerably; nose gets markedly stuffed up; has to breathe through his mouth; was well while he was up in the mountains; began to be troubled on train on his way home a few days ago. Was tested to ragweed, goldenrod and daisy; was found positive to ragweed and negative to the two others. Cultures from nose showed staphylococcus albus and few streptococci; cultures from throat showed streptococci and pneumococci. Autogenous vaccines were made up. He received five injections of autogenous nose and throat vaccine, ranging in doses from 250 to 750 million, at an interval of two to seven days. Each vaccine inoculation was accompanied by increasing doses of ragweed extract in the opposite arm. There was a very marked improvement in symptoms following the second inoculation, and he was well after the fourth treatment (10 days after the beginning of treatment); was given a prophylactic inoculation on Oct. 1 and another on Oct. 15. Discharged, cured as to hay-fever.

This patient has been very happy over the results obtained in his case with the autogenous vaccine. It remains an open question as to the



benefit derived in this, as well as in the next two cases, from the use of the ragweed extract alongside of the vaccine. I hope to be able to settle definitely this question in a future article. It will be interesting to see how he will fare the coming season.

This patient returned June 8, 1916, for prophylactic inoculations before leaving for England. Has been especially well this winter and is feeling fine now.

CASE 5. C. K. E.; male; 22 years. Sept. 18, 1915.

*Family History.*—Father had hay-fever for the last few years; one brother has hay-fever.

*Past History.*—Negative except for "colds" since he has grown up.

*Present Illness.*—Complains of hay-fever; has had it for the last 12 years; comes on usually in the middle of August, lasts until some heavy frosts appear; has had asthma with it for the last three years. No asthma without the hay-fever, and only at night; was quite bad the last few days; had nose operation; spur removed last summer; had his tonsils removed when he was nine years old. The nose operation has not proved of much benefit to the hay-fever; going near horses bothers him a great deal. Was tested to ragweed, goldenrod and daisies; was found positive to ragweed; negative to the others. Cultures from nose showed staphylococcus albus and citreus.

He received six treatments of autogenous vaccines ranging in doses from 50 to 150 million at an interval of 5 to 14 days. He was given at the same time, in the opposite arm, gradually increasing doses of a 1% ragweed extract solution, beginning with min. 3 up to min. 20.

This patient showed a marked improvement following the first inoculation of his autogenous vaccine, and was free from both the hay-fever and asthma following the second inoculation on Sept. 25. All further treatments were more in the nature of prophylaxis. Was discharged well and told to return a month prior to his usual hay-fever season. He showed a very marked improvement generally and was very happy over the result.

This patient returned June 10, 1916, for prophylactic treatment, feeling very well. Cultures from nose showed a very profuse growth of staphylococcus, citreus and albus. A similar growth was present in cultures from conjunctival secretions from which autogenous vaccines were made. He will be followed up with prophylactic inoculations of his autogenous vaccines without the ragweed. The results will be reported upon in a future paper.

CASE 6. B. W. H.; female; 37 years. Sept. 27, 1915.

*Family History.*—Negative.

*Past History.*—No serious illness except "colds" and sore throats. Has had hay-fever for the last 15 years; begins as a rule on the 16th of August and lasts to the end of November. Went to Bothem and felt no relief; has had considerable

stomach upsets for the last two months; lost 12 pounds; is feeling miserable.

*Physical Examination.*—Negative, except for inflammation of the throat, marked inflammation and edema of the nose. Cultures from nose showed staphylococcus (weak) aureus and diphtheroid bacilli, from which an autogenous vaccine was made; she was tested to goldenrod, daisies and ragweed; was found markedly positive to ragweed and negative to the others.

She received seven treatments with autogenous vaccines, ranging in doses from 100 to 250 million, at an interval of 5 to 7 days. She was also given gradually increasing doses of ragweed extract in the opposite arm, receiving 8 inoculations of a 1% solution, ranging in doses from min. 1/4 to min. 6 of the same solution.

This patient has been free from hay-fever practically since Oct. 16, following the third inoculation of vaccine and the second inoculation of ragweed extract. The injection of 2 min. of the ragweed has given rise to such a marked reaction on Oct. 4 and 11 that it was decided to reduce it to 1/4 min., and gradually go up till she has taken 6 min. as a final dose with practically no reaction locally. Her general condition has been very markedly improved; has gained in weight and has been feeling well generally. It remains to be seen how she will fare the coming season.

#### SUMMARY AND CONCLUSIONS.

The bacteria found in the secretions of the nose and eyes of hay-fever patients previous to their attacks and during their supposed healthy condition are markedly suggestive of the important rôle played by such bacteria in this disease. The presence of the bacteria and their products is, I believe, the determining factor between individuals being susceptible to hay-fever or not, since they may be, in a measure, responsible for the breaking up of the pollen, setting free the albumens and thus causing pollenosis. The bacterial infection, though secondary to pollenosis, is apparently responsible for the difference between pollenosis, producing a mere transient sneezing, or true hay-fever attacks with all their accompanying symptoms.

The good results obtained by the use of autogenous vaccines, as found in the literature and those I had myself, still further suggest the important relation of bacteria to this disease.

The mechanism underlying pollenosis, with its accompanying anaphylactic symptoms, is still an open question. I have called attention to the recent developments in the physical mechanism of anaphylaxis which can be applied to this disease: The anti-ferments being adsorbed by the liberated pollen albumens, the symptoms are then produced by the free ferments, which are normally present in the system, but unable to produce toxic symptoms because of the action of the anti-ferments. These free ferments produce the anaphylatoxins, and they in turn produce the anaphylactic symptoms of



hay-fever, which resemble so closely anaphylaxis due to other sources.

The underlying reason for the success of the treatment with autogenous vaccine in this disease is, I believe, due to the fact that the infection is due, in practically all the cases, to the staphylococcus group of organisms. (Five of the six cases here reported were due to the staphylococcus.—2 *S. P. aureus* alone, 1 *aureus* mixed with *albus*, 1 *albus* with *citreus* and 1 *albus* with strepto. The sixth case showed culturally an unidentified bacillus and a diplococcus resembling the pneumococcus.)

Finally the six cases treated with the autogenous vaccine, here reported, can be said to have resulted in "seasonal cures." The results in these cases have been so decidedly beneficial that one cannot help but conclude that the autogenous vaccine has yielded better results in the treatment of these hay-fever cases than any other therapeutic measure thus far suggested in the treatment of this disease.

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## EMBOLIC PNEUMONIA FOLLOWING THE MASTOID OPERATION; REPORT OF THREE CASES.\*

By GEORGE L. RICHARDS, M.D., FALL RIVER, MASS.

Otologist and Laryngologist, Union Hospital.

DURING the last year I have had three cases showing, after the mastoid operation, symptoms of what has apparently been an embolic infarct of the lung, localized and limited, with the early symptoms of a pneumonia, and with an accompanying pleurisy of the same character. I am wondering if cases such as these are not fairly common, and whether the possible occurrence of localized mural thrombi of the lateral sinus should not be considered in the after-handling of our mastoid cases, even when the classical picture of sinus thrombosis is entirely absent.

\* Read at the Forty-ninth Meeting of the American Otological Society, Washington, D. C., May 10, 1916.

CASE 1. R. W. J. Physician. Acute otitis media in right ear June 14, 1915. Incised under ethyl chloride. Relief. Purulent discharge. June 15th pain; June 16th better; June 17th pain. Incised drum again, ethyl chloride anesthesia. No relief from the pain which continued in spite of free discharge, and on June 20th the x-ray showing involvement of the right mastoid, the usual operation for an acute mastoid was performed. The x-ray findings were confirmed, extensive involvement of all the cells being found. The day following he complained of acute indigestion and nausea. June 21st temperature 100° to 102°; June 22d temperature 101° to 101.2°; June 23d temperature 101.6° to 104°. On this date the high temperature was explained by the appearance of definite erysipelas extending backwards, forwards and upwards from the mastoid area. At this time Dr. George L. Tobey, Jr., of Boston, saw him in consultation, the question of sinus thrombosis being under consideration. As there were no chills, the appearance of the erysipelas served in our minds to explain the temperature, which became normal on June 28th. From June 23d to the 27th there was steady disturbance of the stomach and inability to sleep. Aside from this, convalescence was continuous. On July 1st, by his own insistence, and not by advice, he went home from the hospital. On July 4th, after having felt very well for the preceding two or three days, he had a sudden attack of pain in the right lung just below the nipple, accompanied by a temperature of 101° running up to 102.5°, and the spitting up of some bright blood. A diagnosis was made of a localized pneumonia. On July 14th, the twenty-fifth day of the disease, the temperature became normal. On July 20th there was a similar attack in the opposite lung in about the same relative position, and running clinically almost the same course as to temperature and duration, the latter being about four days. From this time onward convalescence was uneventful. At the time it was first considered, did or did not this patient have a mural thrombus of the lateral sinus, a portion of which on two different occasions was later detached, producing an embolic infarct in each lung with a resultant localized pneumonia?

CASE 2. W. A. came under observation on July 13, 1915, for an acute otitis media. An incision in the drum was made under ethyl chloride anesthesia, resulting in immediate relief, but three days later pain re-occurred and a second incision was made. On July 19th an x-ray picture showed involvement of the left mastoid. He was admitted to the hospital on July 21st and on the 22d an operation for an acute mastoid was performed, the patient taking ether rather poorly. The history in the hospital was uneventful from the 22d to the 29th, the temperature not going above 99.5°, and on the latter date he went home at his own request. Three days later, August 2d, he had a sharp pain in his left side, and the diagnosis of pleurisy was given by the attending physician. I did not see him at his home until several days later. Inasmuch, however, as the pain was sharply localized and the attack of rather short duration, in the light of the other two cases here reported I think he had an embolic pneumonia. Recovery was complete, but it was several weeks before the pain in the side had entirely disappeared.

CASE 3. P. H. Male, fifty years old. Sept. 25, 1915, acute otitis media. Drum incised under ethyl chloride. Sept. 26th x-ray picture showed mastoid



involvement, but he refused operation until Sept. 30th, when the entire mastoid area was found filled with pus and broken-down cells. On the day of admission to the hospital the temperature was 99° and on the next day 101° to 102°. In the early morning of October 2d, he complained of a sharp pain in the left lung very decidedly limited and with all the characteristics of embolic pneumonia. There was bloody sputum for a few hours, then frothy. The rest of the lung on each side was free from trouble. The convalescence was uneventful and he was discharged on Oct. 10th.

#### REMARKS.

In all of these cases there was a sudden attack of pain, which on physical examination appeared to be due to shutting off of a portion of lung, that is, to be the result of an infarct following an embolus and with an accompanying pleurisy. Just such symptoms and just such physical signs might be expected to follow the lodgment of a small mural thrombus from the lateral sinus, and its passage down to the right side of the heart, and thence into the lung. In all three cases the trouble appeared on the side of the operation, and that side only, with the exception of the first case, where both sides were affected.—the side of the operation first. There was no uniformity in the time area, the attacks coming in respectively two days, eleven days, twenty-two and twenty-eight days. In each instance, ethyl chloride had been used as the primary anesthetic. Had this anything to do with the case? I think not.

### Book Reviews.

*Oral Surgery.* A Treatise on the Diseases, Injuries and Malformations of the Mouth and Associated Parts. By TRUMAN W. BROPHY, M.D., D.D.S., LL.D., Sc.D., F.A.C.S. With special chapters by MATTHEW H. CRYER, M.D., G. HUDSON MAKUEN, M.D., WILLIAM J. YOUNGER, M.D., F. W. BELKNAP, M.D., CALVIN S. CASE, M.D., D.D.S. With 909 illustrations, including 39 plates in colors. Philadelphia: P. Blakiston's Son and Company.

In his preface the author says, "I wish to emphasize an underlying principle of surgery: so to operate as to leave the parts in as nearly a normal anatomical condition as possible; and further, briefly and concisely to supply students, physicians, dentists, and general and oral surgeons with information relative to the symptoms, diagnosis and treatment of conditions affecting the mouth and associated parts."

The author is unable, in spite of efforts to be brief, to give us a book of less than 1100 pages; it is true that a prodigious number of illustra-

tions are included in these pages; many of these pictures are brilliant, and all of them amplify the text. But it seems, from some standpoints, that students would be better served by a shorter text-book.

The volume is very complete; all phases of oral surgery are covered, even to eugenics and infant feeding! The chapter on Tumors is perhaps less proportionately extensive than some of the others; and the entire subject of anesthesia is included in 32 pages of printed matter and illustrations. But, on the whole, the space is divided fairly in relation to the importance of the various subjects.

So large a book upon a special subject is difficult to review adequately. The volume should become an authority, as its author has been for many years.

*Autoplastic Bone Surgery.* By CHARLES DAVIDSON, M.D., and FRANKLIN D. SMITH, M.D. With 174 illustrations. Philadelphia and New York: Lea and Febiger. 1916.

An admirable and very interesting book of 250 pages. It includes an account of the experimental and clinical work of the authors, and a survey of what seems to them best in the enormous literature which has grown up during the past decade upon this important subject. No final decision is reached in regard to many theoretical considerations, but definite views are offered for practical surgical conditions.

A concise summary at the end of each important chapter is a great convenience to the reader.

The book is cordially recommended to students and surgeons.

*Encyclopedia Medica.* Second edition, under the general editorship of J. W. BALLANTYNE, M.D., C.M., F.R.C.P. Vol. III. Edinburgh and London: W. Green and Son, Ltd. 1916.

The first volume of the new edition of this standard medical encyclopedia was reviewed in the issue of the JOURNAL for Sept. 9, 1915, and the second in the issue for Jan. 27, 1916. This third volume continues the work under the captions from chloroform to dyspnea. The first of these separate articles, and others on cranio-cleido-dysostosis and on legislation for mental deficiency, are new in this edition. The remaining articles are revised or re-written. All the articles on drugs have been revised by Dr. John Orr, the author of the section on digitalis. There are few text-ents in this volume, but several excellent full-page colored plates. The work maintains its important and valuable character.



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## THE ACTION OF ALCOHOL.

ABOUT few scientific questions have there been more dispute and less accurate data than about the physiological action of alcohol. The matter is coming into increasing prominence and the attitude toward it of the medical profession is changing. The extension of the prohibition campaign and the inclusion of social and moral issues have made all the more confusion as to the fundamental facts on which judgment must finally rest.

The recent policy of the New York City Department of Health is significant of the growing opinion that alcohol is a public health problem of first magnitude. The Health Department is not in sympathy with effort to regulate the trade in alcoholic drinks by legislation but believes that a proper education of the people in the actual effect of alcohol is the only logical course, and that this course will eventually bring the proper restriction in the use of alcohol as a beverage. This comes back then to the

question of what is the real action of alcohol.

That alcohol in small doses is burned in the body and spares body and food substance has been proved by Atwater and his associates. Exact and controlled experiments on the physiological action of alcohol on metabolism and the nervous system have, however, been few, and reliable data are correspondingly rare. Benedict outlines a program prepared by the Boston Nutrition Laboratory of the Carnegie Institution for the study of alcohol and describes the results to date. (*Science*, June 30, 1916.) Benedict points out that the use of alcohol as a food beverage, especially in Europe where often the food calories of the alcohol are greater than those from the protein of the diet, makes it important and within the province of the nutrition laboratory to undertake investigation of the effect of moderate doses. He recognizes the excessive rarity of objectivity as well as of real uncontaminated scientific evidence. Too often the personal ethical views of the observer have dominated the results.

The program outlined by the Nutrition Laboratory provides for thorough study of the physiological effect of alcohol, in small and in repeated doses, on respiration, digestion and secretion, metabolism and heat regulation. Attention is paid to securing careful basic data on the subjects of experiment and in short every effort has been made to forestall criticism even of the ignorant and captious, and to secure and present definite objective data and also to determine a method of procedure which can be followed in future investigations. Particular attention is given to the psychological effects of alcohol.

The selection of the tests to be employed was determined first by the wish to secure a group of systematically coördinated measurements second to utilize the relatively simple and elementary neuro-muscular phenomena where unknown factors would be reduced to a minimum, and third to select those processes which constituted customary reactions.

Benedict reports that in normal subjects the latent time of the patellar reflex was lengthened on an average by 10%, while the extent of muscle thickening was reduced by 46%. The latent time of the protective lid reflex was increased by 7% and the extent of the lid movement was decreased 19%. The latent time in speech reaction tests was increased 3%. Sensitivity to faradic stimulation was decreased 14%. Little



effect was noted on memory and free association. As for motor coördination, there was a decrease of 9% in the velocity of finger movement and of 11% in the velocity of eye movement. It was observed that the pulse was accelerated, but this Benedict ascribes to inhibition of the inhibitory mechanism of the heart. The greatest changes following the ingestion of alcohol were found to be in those processes least subject to voluntary re-enforcement and control. A considerable practice effect was noted throughout the experiments but even this was more than offset by the action of the alcohol.

The time of the maximum effect of the alcohol was from 90 to 100 minutes after ingestion. Benedict states that contrary to Kraepelin no facilitation effect from alcohol was noted, but that there seemed to be a characteristic depression of the simplest forms of finger and eye movements. He holds this to be presumptive evidence of the effect of alcohol on organic efficiency, but he warns strongly against the uncritical application of these results to industrial processes in general where motor coördination is not the only factor involved.

These studies are not completed and the material already obtained is being further elaborated. Such work when confirmed by independent investigators will give a reliable foundation for the attitude to be assumed toward alcohol as a public health problem.

### HAY FEVER.

THE present issue of the JOURNAL, which is published as a special number devoted to hay fever and anaphylaxis, contains a series of articles devoted to anaphylactic phenomena especially with reference to the disturbances associated with hay fever. Particular attention is directed to the work of Dr. Goodale and his associates. The author's earlier work upon this subject, which has now a special seasonal interest, was published in the issues of the JOURNAL for November 5, 1914, Vol. clxxi, p. 695, and July 8, 1915, Vol. clxxiii, p. 42. In the former issue there appeared also a preliminary article on asthma in children by Dr. F. B. Talbot, whose latest contribution on this subject is included in the present number.

The importance of hay fever as constituting one of the serious inconveniences—though perhaps not so dangerous—in the lives of many persons is probably underestimated except by those

who are personal sufferers. The number of those affected is perhaps also not fully realized. Careful recent estimates show that there are at least 200,000 persons in the United States who suffer from recurrent annual attacks of the disease. It appears now fairly well determined that hay fever is an anaphylactic manifestation characterized chiefly by vasomotor phenomena.

It is perhaps not generally known that ordinances providing for the cutting of weeds likely to disseminate the disease have been adopted in several American cities. Apparently the first of these was an ordinance, originally passed by the council of the city of Savannah, in August, 1900, providing for the removal of weeds and other rank vegetable growth within the city limits. This law was subsequently amended on July 3, 1910. In substance it provides that the owner of private property, or agents acting in his behalf, shall, upon notice from the health officer of the city of Savannah, cut and remove from such property in the city any weeds or other rank vegetable growth. Penalty for failure to comply with this ordinance is fixed at a fine of \$50.00 or imprisonment for 30 days, or both. Similar ordinances were subsequently passed by New York City and by New Orleans.

### DIAGNOSTIC CULTURE OF TUBERCLE BACILLUS.

ANY procedure which will facilitate the early diagnosis of pulmonary tuberculosis, especially in the absence of bacilli in the sputum on ordinary examination, is to be welcomed. The method of Petroff for the cultivation of tubercle bacilli is not a radically new procedure, but it offers a practicable means for isolating tubercle bacilli from the sputum as well as from tissues, and often this method of cultivation will show the bacilli when other examinations fail.

The method is roughly as follows: About 5 cc. of sputum under sterile precautions are incubated for half an hour at 37 degrees with 3% sodium hydroxide. After neutralization with hydrochloric acid and centrifugation, the sediment is planted on a special gentian violet egg yolk medium, and then incubated at between 38 and 39 degrees. The culture tubes are covered with a mixture of yellow wax and petrolatum to prevent drying.

In describing the application of this method



to the clinical diagnosis of tuberculosis, Keilty (*Jour. Exp. Med.*, July, 1916) concludes that the method is not difficult, requiring only a careful degree of attention to detail. He finds that the method is of very practical value in cases where the bacilli have not been found in ordinary examination of the sputum and that it is a diagnostic procedure which should be employed in such cases. A negative result is of course of no significance. He believes that it supersedes the antiformin method, having all of the good qualities of the latter, and some in addition. It is possible by this method, as Keilty demonstrated, to isolate the tubercle bacillus from a throat swab. He also found that by the digestion of tissue with sodium hydroxide and then cultivation according to Petroff, it was possible to demonstrate the tubercle bacilli in tissue and save time over the slower method of animal inoculation.



#### THE MASSACHUSETTS COMMISSION ON MENTAL DISEASES.

GOVERNOR McCALL has nominated the following as members of the new commission on mental diseases under the terms of Chapter 285 of the Acts of the Legislature of this year, in place of the old State Board of Insanity: Director, George M. Kline, M.D., of Hathorne, with a salary of \$7500, for the term of five years; associate directors, without salary: John B. Tivnan of Salem, for four years; Henry M. Pollock, M.D., of Boston, for three years; Charles G. Dewey, M.D., of Dorchester, for two years; Elmer A. Stevens of Somerville, for one year. We think the Governor has made a wise selection in naming Dr. Kline as director. He is a graduate of University of Michigan Medical Department in 1901, and has established a record as an able administrator while superintendent of the Danvers State Hospital for the Insane during the past four years. He had previously served as assistant physician at the Worcester State Hospital, at the Mt. Pleasant, Iowa, State Hospital, and at the State Psychopathic Hospital of Michigan, where he was for six years before coming to Danvers.

Dr. Pollock is a graduate of the College of Homeopathic Medicine and Surgery of the University of Minnesota in 1897, and is superintendent of the Massachusetts Homeopathic Hospital, having been recently superintendent of the Norwich, Connecticut, Hospital for the Insane. Dr. Dewey is a graduate of Dartmouth

Medical School in 1886, was trained under the late Dr. George F. Jelly, and has been examiner in mental disease in the Institutions Department of the City of Boston for many years. Mr. Tivnan was trustee of the Bridgewater State Farm for fourteen years, and latterly chairman of the board, and he has been identified for a long time with the Plummer Farm School and the Associated Charities of Salem. Mr. Stevens is vice-president of the Massachusetts Trust Company of Boston, and was formerly state treasurer, thus representing the business man on the commission.

Under the law, the director is the administrative and executive head of the commission. He is charged with administering the laws having to do with the classes of persons under the supervision of the commission, of preparing rules and regulations, appointing agents and subordinate officers and fixing their compensation, subject to the approval of the governor and council. The thought comes to the student of medical institutional government that the provision of the law requiring that at least two of the associate board, besides the director, "shall be physicians and experts trained in the care and treatment of the insane"—three out of five directors—is an unnecessary requirement, and hampers the governor in his choice of appointees. The desirable qualities in medical men for such positions are, training in administrative work and the ability to labor harmoniously with others for the good of the service. The new commission is a neutral board and does not represent in its membership the proponents of the outgoing paid board of three commissioners nor the preceding unpaid board with a paid secretary. Whether, as constituted, the associate board will be of great assistance to the director in the transaction of the business of the commission remains to be seen. No doubt the Governor had a difficult task to harmonize the warring elements and to find suitable material. The JOURNAL extends its best wishes to the Commission for a harmonious and efficient career.



#### MEDICAL NOTES.

BUFFALO, N. Y., DEPARTMENT OF HEALTH.—The recently issued report of the Department of Health of Buffalo, N. Y., presents a complete and illuminating account of public health administration in that city. A study of the comparative statistical table points out some im-



portant facts. In 1882, when the city's population was 157,000 there were 4212 deaths with 4800 births, or an excess of only 597 births over deaths; this gave the city a death rate of 24.06 and a birth rate of 27.47 per thousand. In 1915, the population was 461,887, with 6853 deaths and 12,683 births, or an excess of 5830 births over deaths; giving a death rate of 14.83 and a birth rate of 27.45 per thousand. Thus, it will be noted that although the population constantly increased, yet the death rate decreased to such an extent that even the actual number of deaths in 1915 was but 852 in excess of those in 1891, while the population had increased by 6223. On the other hand the difference in births amounted to 4374. An analysis of the ages of death shows that out of a total of 6853, the greatest number (916) died between the ages of 50 and 60 years, and the smallest number (31) between the ages of four and five years. It is also notable that 1630 died under two years of age, and 1935 died between the ages of 60 and 100 years.

**SMALLPOX IN GREECE.**—Report from Athens by way of Paris, on July 20, states that smallpox is at present extensively epidemic in Athens and the Piraeus. Compulsory universal vaccination has been ordered. The number of cases is not stated.

**RED CROSS NURSING BUREAU.**—Report from Washington, D. C., on July 31, announces the appointment of Miss Clara D. Noyes, superintendent of the Bellevue Hospital Training School, to be superintendent of the Nursing Bureau of the American Red Cross Society, beginning October 1.

**PROGRESS OF POLIOMYELITIS EPIDEMICS.**—Report from New York on August 4 states that the total number of cases of poliomyelitis in that city during the present epidemic to that date was 4680 with 1025 deaths. In New York State, outside New York City, during the same period there were 545 cases and 51 deaths.

In Massachusetts from July 1 to August 5 there were 131 cases and 17 deaths. Of these, 12 cases were in Boston and 11 each in New Bedford, North Adams, Westfield, and Worcester. In New England, outside of Massachusetts, there have been in Rhode Island 34 cases and six deaths. On Aug. 3 a case was reported at Manchester and one at Keene, N. H.

For the purpose of coordinating research on poliomyelitis, the New York commissioner of health last week invited a number of well known pathologists and bacteriologists throughout the United States to meet in New York City on August 3 and 4, for the purpose of planning a series of investigations likely to effect a successful solution of the problem. Those invited are as follows:

Dr. George J. Adami, McGill University; Dr.

Charles Bass, Tulane University; Dr. Ludwig Hektoen, University of Chicago; Dr. Paul Lewis, Vanderbilt University; Dr. Francis W. Peabody, Peter Bent Brigham Hospital, Boston; Dr. Milton J. Rosenau, Harvard University; Dr. Theobald Smith, Rockefeller Foundation; Dr. Victor Vaughan, University of Michigan and Dr. William H. Welch, Johns Hopkins University.

Associated with these will be the following representatives of the prominent research laboratories in New York City:

Dr. William J. Elser, Dr. Simon Flexner, Dr. Emanuel Libman, Dr. Hideyo Noguchi, Dr. Charles Norris, Dr. William H. Park, Dr. Francis Carter Wood, and Dr. Hans Zinsser.

Those who have already accepted this invitation are Dr. Vaughan, Dr. Rosenau, Dr. Jobling, and Dr. Lewis. The meeting was held in the faculty room of the College of Physicians and Surgeons of Columbia University, and a report of its proceedings will appear in next week's issue of the JOURNAL.

#### EUROPEAN WAR NOTES.

**WAR RELIEF FUNDS.**—On Aug. 5 the totals of the principal New England relief funds for the European War reached the following amounts:

Belgian Fund.....	\$142,155.81
French Wounded Fund.....	107,328.51
Armenian Fund.....	63,181.73
French Orphanage Fund.....	58,741.18
Surgical Dressings Fund.....	41,803.87
Belgian Tobacco Fund.....	33,432.15
Facial Hospital Fund.....	23,916.01
Alles' Tobacco Fund.....	1,504.75

#### MEXICAN NOTES.

**RED CROSS BASE HOSPITALS.**—The full list of twenty-five Red Cross mobile base hospitals under the charge of as skilled surgeons and nurses as our country affords was made public on July 30 by Col. Jefferson R. Kean, Medical Corps, U. S. A., Director General of Military Relief of the American Red Cross. This list not only names the "mother" hospitals and their locations, but in most instances the directors and assistants of the base hospitals, each of which is organized or being organized at an initial cost of \$25,000. Col. Kean also mentions two field columns or ambulance companies. The organizing of these hospitals, which, in war time, would pass under the immediate authority of the War Department and be transported to the base of military operations as they were needed, is considered a piece of war relief, preparedness along scientific and constructive lines, and is based in part on the lessons of the European War. The nucleus for the directing personnel of each base hospital is selected from the staff of a large existing civil hospital and when that personnel is transported, on the outbreak of war, to the base of military operations, they



continue at their respective posts, working in the same team-like fashion they employed in civil capacities. Connecting the evacuation or transfer hospitals of the Army with the base hospitals of the Red Cross are the field columns, two of which are being perfected at an expense of about \$15,555 each.

The Director General of Military Relief made this statement concerning the base hospitals and field columns:

"The medical officers attached to regiments, together with those manning the field hospitals and evacuation hospitals, constitute the medical service of the front. These field and evacuation hospitals would, in the opinion of our readers, scarcely deserve the name of hospitals, since they are marching units and have to be provided with only the simplest and most Spartan equipment. Their furniture is bed-sacks, filled with hay and laid on the ground, or camp cots. There are shelter places where the wounded are received, fed, and protected from the weather on their way to the rear. The service of the front is, therefore, the special obligation of the medical officers of the Army and of the National Guard, and the Red Cross is not permitted to share it.

"The next zone, however, which is called the zone of the line of communications and base, is one in which the Red Cross will provide the greater part of service, as the number of medical officers in the Army Medical Corps and connected with the National Guard is quite inadequate to provide such a service. The hospitals provided by the Red Cross, because they are located at the military base, are called base hospitals. They are of great importance, because they are the first real hospitals provided with beds, mattresses, sheets, and trained nurses which the wounded soldier finds on his journey to the rear.

"The base hospitals will receive regular, volunteer, and national guardsmen alike, and so every soldier whose duty brings him within range of hostile bullets has reason to take a keen, personal interest in the knowledge that in these hospitals is being now enrolled the most distinguished talent in the medical profession in this country.

"Each division of troops requires at least one base hospital. It is equipped to receive 500 patients. Its professional staff consists of 23 physicians and surgeons, two dental surgeons, a chaplain, and 50 trained nurses. To assist the latter are enrolled 25 volunteer nurses' aids. The enlisted personnel numbers 153, while authority is given for the employment of about 15 civilians.

"The Naval base hospitals, of which several are now in course of organization, are of about one-half the size of the Army hospitals. The medical equipment of one of the Army base hospitals is estimated to cost about \$25,000, and of a Naval base hospital about \$15,000.

"This equipment should be purchased in time of peace and kept in store by the government, as, if properly stored, very few of the articles suffer much deterioration, and if the purchase is put off until time of war it is only with great delay and difficulty that it can be secured. To avoid this delay and to render the units promptly fit for service many of the Red Cross Chapters in cities where base hospital units are being organized have raised money to purchase it.

"It was anticipated that arrangements could easily be made for the storage of this equipment service on government reservations, but in this expectation the Red Cross has been disappointed, and most of the Chapters now find that they must make further appeal to individual patriotism and generosity to obtain a storage place for it.

"The great advantage of organizing these units in connection with large civil hospitals is that in this way is secured a personnel who know each other and who are accustomed to work together so that team-work and good organization are possible at the outset."

The following are the Red Cross base hospitals already organized:

*Presbyterian Hospital, New York City*—(Equipment subscribed): Director, Dr. George E. Brewer, also Chief of Surgical Service; Principal Assistant, Dr. Alfred Stillman; Chief of Medical Service, Dr. Warfield T. Longcope; Chief of Laboratory Service, Dr. Karl M. Vogel; Chief Nurse, Miss Anna C. Maxwell.

*Mount Sinai Hospital, New York City*—(Equipment subscribed): Director, Dr. N. E. Brill; Chief of Surgical Service, Dr. Howard Lillenthal; Chief of Medical Service, Dr. R. Weil; Chief of Laboratory Service, Dr. George Baehr; Chief Nurse, Miss Elizabeth A. Greener.

*Belleue Hospital, New York City*—(Equipment subscribed): Director, Dr. George David Stewart, also Chief of Surgical Service; Chief of Medical Service, Dr. Van Horne Norris; Chief of Laboratory Service, Dr. Charles Norris; Chief Nurse, Miss Clara D. Noyes.

*New York Hospital, New York City*—(Equipment subscribed): Director, Dr. Charles L. Gibson, also Chief of Surgical Service; Chief of Medical Service, Dr. Lewis A. Conner, Chief of Laboratory Service, Dr. William J. Elser; Chief Nurse, Miss M. H. Jordan.

*New York Post Graduate Hospital, New York City*—(Equipment subscribed): Director, Dr. Samuel Lloyd; Chief of Surgical Service, Dr. Edward W. Peterson; Chief of Medical Service, Dr. Arthur F. Chace; Chief of Laboratory Service, Dr. Ward J. MacNeal; Chief Nurse, Miss Amy Patmore.



*Brooklyn, N. Y., for Navy*—Equipment subscribed): Director, Dr. W. B. Brinsmade, also Chief of Surgical Service; Chief of Medical Service, Dr. Luther F. Warren; Chief of Laboratory Service, Dr. Robert F. Barber; Chief Nurse, Miss Frances Van Ingen; Asst., Mrs. Lillian H. Read.

*Massachusetts General Hospital, Boston, Mass.*—(Equipment subscribed): Director, Dr. Frederic A. Washburn; Chief of Surgical Service, Dr. George W. W. Brewster; Chief of Medical Service, Dr. Richard C. Cabot; Chief of Laboratory Service, Dr. J. Homer Wright; Chief Nurse, Miss Sara E. Parsons.

*Boston City Hospital, Boston, Mass.*—(Equipment subscribed): Director, Dr. J. J. Dowling; Chief of Surgical Service, Dr. Edward H. Nichols; Chief of Medical Service, Dr. John Jenks Thomas; Chief of Laboratory Service, Dr. Arial W. George; Chief Nurse, Miss Emma M. Nichols.

*Harvard University, Cambridge, Mass.*—(Equipment subscribed): Director, Dr. Harvey Cushing, also Chief of Surgical Service; Chief of Medical Service, Dr. Roger I. Lee; Chief of Laboratory Service, Dr. Richard P. Strong; Chief Nurse, Miss Carrie M. Hall.

*Lakeside Hospital, Cleveland, O.*—(Equipment subscribed): Director, Dr. George W. Crile; Chief of Surgical Service, Dr. W. E. Lower; Chief of Medical Service, Dr. C. F. Hoover; Chief of Laboratory Service, Dr. H. T. Karsner; Chief Nurse, Miss Grace Allison.

*Rochester, N. Y.*—Director, Dr. John M. Swan; Chief of Surgical Service, Dr. C. W. Hennington; Chief of Medical Service, Dr. William V. Ewers; Chief of Laboratory Service, Dr. C. C. Sutter; Chief Nurse, Miss Emma Jones; Asst., Miss Jessica Heal.

*Johns Hopkins Hospital, Baltimore, Md.*—Director, Dr. Winford Smith; Chief of Surgical Service, Dr. J. M. T. Finney; Chief of Medical Service, Dr. T. C. Janeway; Chief of Laboratory Service, Dr. T. R. Boggs; Chief Nurse, Miss Bessie E. Baker.

*Harper Hospital, Detroit, Mich.*—Director, Dr. Angus McLean; Chief of Surgical Service, Dr. C. D. Brooks; Chief of Medical Service, Dr. B. R. Shurley; Chief of Laboratory Service, Dr. P. M. Hickey; Chief Nurse, Miss Emily McLaughlin.

*University of Pennsylvania, Philadelphia, Pa.*—Director, Dr. Edward Martin; Chief of Surgical Service, Dr. John Deaver; Chief of Medical Service, Dr. Alfred Stengel; Chief of Lab-

oratory Service, Dr. Alan J. Smith; Chief Nurse, Miss Irwin.

*Pennsylvania Hospital, Philadelphia, Pa.*—(Equipment subscribed): Director, Dr. Fred H. Harte; Chief of Surgical Service, Dr. John H. Gibbon; Chief of Medical Service, Dr. George W. Norris; Chief of Laboratory Service, Dr. Edward Krumhaar; Chief Nurse, Miss Elizabeth Dunlop.

*Barnes Hospital, Washington University, St. Louis, Mo.*—(In process of organization): Director, Dr. Fred T. Murphy; Chief of Surgical Service, Dr. Malvern Clopton; Chief of Medical Service, Dr. Walter Fischell; Chief of Laboratory Service, Dr. Eugene L. Opie; Chief Nurse, Miss Julia Stimson.

*Chicago, St. Joseph, St. Mary and Augustana Hospitals*—(Equipment subscribed): Director, Dr. Albert J. Ochsner, also Chief of Surgical Service; Chief of Laboratory Service, Dr. Oscar Nadean; Chief Nurse, Mrs. Julie Flekke.

*Chicago, Mercy and Wesley Hospitals*—(Equipment Subscribed): Director, Dr. Fred A. Besley; Chief of Surgical Service, Dr. Joseph Jaros; Chief of Medical Service, Dr. Milton Mandell; Chief Nurse, Miss Daisy Ueh.

*Cincinnati, O.*—Director, Dr. G. A. L. Reed.  
*University of Pittsburgh, Pittsburgh, Pa.*—Director, Dr. R. T. Miller.

*Chicago, Presbyterian and County Hospitals*—(Equipment subscribed): Director, Dr. Frank Billings; Chief of Surgical Service, Dr. Arthur Dean Bevan; Chief of Medical Service, Dr. Ernest E. Irons; Chief of Laboratory Service, Dr. Homer K. Nicoll; Chief Nurse, Miss Mabel K. Adams.

*Chicago, St. Luke's and Michael Reese Hospitals*—(Equipment subscribed): Director, Dr. L. L. McArthur.

*Lincoln Hospital, N. Y.*—(Equipment subscribed): Director, Dr. Frank Gwyer.

*Rochester, Minn., The Mayo Clinic*—Director, Dr. Edward S. Judd.

*The German Hospital, New York City*—Director, Dr. Frederick Kammerer.

#### FIELD COLUMNS.

(Ambulance Companies)

*New York City*—\$10,000 subscribed for equipment: Director, Dr. T. M. Strong.

*Berkeley, Calif.*—Director, Dr. R. T. Legge



**MEXICAN RELIEF FUNDS.**—On Aug. 5 the totals of the principal funds for the relief of Massachusetts troops on the Mexican frontier reached the following amounts:—

Volunteer Aid Fund.....	\$74,467.65
Home Relief Fund.....	2,508.00
Eighth Regiment Fund.....	2,225.00

#### BOSTON AND NEW ENGLAND.

**DIPHTHERIA AT MASSACHUSETTS GENERAL HOSPITAL.**—An outbreak of diphtheria has recently occurred at the Massachusetts General Hospital. On Aug. 6 there were 32 positive cases of the disease, including 29 nurses, two physicians, and one ambulance driver. No patients have been infected and there have been no fatalities. The source of the outbreak is as yet undetermined.

**HAVERHILL BOARD OF HEALTH.**—The thirty-sixth annual report of the Haverhill, Mass., Board of Health states that the death rate of that city for the year 1915 was 13.75 per thousand inhabitants, this being the lowest mortality rate in the history of the city. The total number of deaths was 677. The average age of decedents during the year was 45 years, 10 months and 14 days, the highest in the past thirty-five years.

**MASSACHUSETTS BOARDS OF HEALTH.**—A quarterly meeting of the Massachusetts Association of Boards of Health was held on July 27 at Providence City Hospital with about 75 members in attendance. Addresses were made by Mayor Gayner of Providence, Dr. Charles V. Chapin, Superintendent of Health of Providence, and by Mr. Franz Schneider, Jr., of the Russell Sage Foundation of New York City, on Relative Values in Public Health Work.

**ANTHRAX IN MASSACHUSETTS.**—The Massachusetts Board of Labor and Industries has recently conducted a statistical study of anthrax in this commonwealth. During the year 1915, there were 30 human cases of this disease in Massachusetts, with six deaths. During the year 1916 thus far there have been 22 cases and five deaths.

#### Miscellany.

##### CHANGES IN THE MEDICAL CORPS, U. S. NAVY, FOR THE WEEK ENDING JULY 22, 1916.

July 11.

Surgeon C. D. Langhorne, detached *Oklahoma* to two months leave.

Surgeon M. K. Johnson, detached *Montana* to *Oklahoma*.

July 12.

P. A. Surgeon C. P. Lynch, commissioned from February 19, 1916.

Asst. Surgeon O. C. Foote, detached *Tallahassee* to *Delaware*.

July 13.

Asst. Surgeon Howard Priest, detached *Delaware* to *Tallahassee*.

Asst. Surgeon R. H. Greenough, commissioned May 25, 1916.

July 17.

Asst. Surgeon J. T. Boone, detached *Marine Brigade, Haiti*, to treatment, *Naval Hospital, Norfolk, Va.*  
Asst. Surgeon C. F. Glenn, M.R.C., to *Naval Recruiting Station, Burlington, Vt.*

Asst. Surgeon G. E. Faulkner, M.R.C., to *Recruiting Station, Naval, New Orleans, La.*

Asst. Surgeon L. D. Arbuckle, M.R.C., to *Navy Recruiting Station, Boston, Mass.*

July 18.

P. A. Surgeon J. A. Biello, temporary duty, *Naval Recruiting Station, New York, N. Y.*

July 19.

Asst. Surgeon Henry McDonald, detached *Colorado* to *Pittsburgh*.

#### APPOINTMENTS.

Dr. Victor F. Anderson has been appointed to take charge of the Medical Department and Psychological Laboratory of the Boston Police Corps.

Dr. Lyman A. Jones, formerly district health officer in Berkshire and later in Essex, Mass., has been appointed to succeed Prof. Selskar M. Gunn as director of hygiene of the Massachusetts State Department of Health.

#### RECENT DEATHS.

DR. GEORGE ARTHUR STONE died at his home in Pigeon Cove, Rockport, Mass., July 28, aged 50 years. Dr. Stone was born in Ipswich, Mass., was a graduate of Harvard Medical School in 1880, and joined the Massachusetts Medical Society in the same year. He had practised in Pigeon Cove for 18 years and had been a member of the school board. He was a Mason. He is survived by a widow and one son.

DR. MICHAEL KELLY, a pediatrist of Fall River, Mass., died in that city July 28, aged 62 years. He was born in Ireland, went to Fall River in 1869 and graduated from Holy Cross College in 1879, and from Bellevue Medical College in 1885 when he settled in practice in Fall River. He was chairman of the board of health for seven years, and was a member of the Massachusetts Medical Society from 1901 until February of this year. He leaves a wife and three children.

DR. ADOLPH LAMAR who died of heart disease on July 25, in New York City, was born at Havana, Cuba, in 1869. He was a graduate of the University of Havana and a practitioner and member of the board of health in that city. He is survived by his widow and one daughter.

DR. L. ALBERT NEISSER, Professor of Dermatology in the University of Breslau, died at Berlin on July 30.

DR. SAMUEL SILVA, who died of cerebral hemorrhage on July 30 at Southbridge, Mass., was born at Fayal in the Azores, in 1836. He was a graduate of the Harvard Dental School and had practised his profession in Southbridge for many years.



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### Address.

#### TUBERCULAR INFECTION IN INFANCY AND CHILDHOOD.\*

BY VANDEPPEL ADRIANCE, M.D., WILLIAMSTOWN, MASS.

IN the bulletin of the Massachusetts Trustees of Hospitals for Consumption, December, 1913, it was stated: "The importance of childhood infection is coming to be recognized as a most important factor in anti-tuberculosis work. The Board wishes to impress upon physicians and anti-tuberculosis workers throughout the State the absolute necessity of recognizing and treating tuberculous infection in children if we are ever going to make any headway against the disease. There is too much of a tendency to wait until people become sick before we cure them. The bulk of patients at present under treatment in our sanatoria represents the results of infection when they were children."

On August 1, 1914, the same Trustees sent to each physician of the Commonwealth a letter which said:

"It is your opportunity, first, to protect these children from infection, and second, to see that they are cared for when such infection has taken place. If you delay making a diagnosis until actual disease is evident, the case has probably gone beyond the stage when cure is possible. A diagnosis of 'infection', as contrasted with a diagnosis of 'disease' is the key to this problem."

\* Read at a meeting of the Berk-shire District Medical Society.

Under such instructions it behooves us to try to understand the situation as accurately as possible, and it is in order to bring new facts to your attention that I am glad to bring certain statements before you which have been forced upon my attention in the course of recent reading.

Von Behring says, "Tuberculosis in the adult is the result of a song begun in the cradle of the infant," and Biggs<sup>1</sup> states, "The conviction has gradually been strengthened that the first infections from tuberculosis occur during infancy and childhood, and extreme care is required if this is to be avoided in tuberculous families."

It is important for us to do away with the old idea that tuberculosis is inherited, for the experience of pathologists seems to prove that tubercular lesions are extremely rare in the new born. It is no wonder that C. J. Gruber<sup>2</sup> considers a congenital case so unusual as to be worthy of reporting. Tuberculosis is also rare during the first weeks of life, but gradually increases. It is during childhood that the greatest amount of tuberculosis is contracted, however, and people interested in human tuberculosis cannot help being interested in the experiments with cattle at Woodcroft, reported by Harlow Brooks, which show that tubercular cows and bulls can be safely used for breeding, providing the offspring are removed from their infected progenitors and the calves taken away from them directly after birth. In this way pure, tubercular cows which are tubercular may be safely used to perpetuate desirable traits, and great loss to the result of their slaughter is avoided. The offspring, however, should be very strictly cared



antined. This reasoning can be applied to children, for if calves can be saved from infection, it is possible to protect the children of infected parents. Accumulated evidence shows that childhood infection is only the beginning of an adult tuberculosis, and if the children are protected, adult tuberculosis will diminish. This theory rests upon the supposition of a latent tubercle, a view which has lain dormant since it was advocated by Weigert, Harbitz and Patruschky, who wrote upon this subject ten years or more ago, stating that all cases of pulmonary tuberculosis occurring in adult life represent infections in the household in early life.

In order to understand much of the recent progress in our knowledge of tuberculosis the importance of von Pirquet's reaction must be realized. It has changed many of the old ideas and been the basis of many investigations which now flood medical literature; and in order that the physicians of the Commonwealth might better understand the practical application of this reaction, the Trustees informed us a year ago that they wished the profession to know of its practical workings, and offered opportunity at convenient places throughout Massachusetts where the profession might be instructed. The use of the test has modified our views of tuberculosis in childhood. It determines the infection of the patient. Although the infection is suspected, it is definitely proved by the test. It is the appeal of the State Board of Health that the children be protected even against infection, but when infected and proven so by the test, that they be protected against the actual development of the disease. The von Pirquet or tuberculin test is more delicate than a macroscopic examination of the body after death, for it proves an infection even when there are no gross lesions. It tells us when people are infected, although they may appear perfectly healthy and may be passed as healthy by the most searching physical examination. On the other hand, the presence of the test occurs in all stages of the disease. It may be present with a mild infection, with a small area of localized tuberculosis, with an acute general military tuberculosis, or it may be present in the final stages of chronic tuberculosis. The only thing that a positive von Pirquet reaction proves is that there is an infection with tubercle bacilli. On the other hand, when the test is positive, it is not necessary to be pessimistic, for it does not necessarily mean disease.

There is one thing which studies with the von Pirquet reaction have drawn to our attention, namely, that the great mass of tubercular people are infected in the family. Family infection plays a great part in the spread of the disease. A large proportion of infections in individuals are present as the result of infection from one individual to another, and this usually occurs from the old to the young. Infection beginning in adult life is not nearly so

much to be dreaded as infection in the infant, and when we accept this we shall come much nearer to the solution of the anti-tuberculosis problem. When there is an adult with tuberculosis the children of the family should be carefully examined. McCorison<sup>4</sup> emphasized the rôle of family clusters in an address at a recent meeting of the Massachusetts Anti-tuberculosis League. Among the patients which were admitted to the North Reading Sanitarium he found 134 distinct families in which at least three cases of pulmonary tuberculosis occurred. In studying the records of one-tenth of the admissions to the Sanitarium it was proven that a group of at least three consumptives was found clustered about the one who was sent away for treatment. As the result of a study of the spread of tuberculosis in families, by Herbert Lampson<sup>5</sup> of the University of Minnesota, the author concludes, first, that the spread of tuberculosis in families where open cases of tuberculosis exist is greater than it is generally understood to be. Sixty-seven per cent. of the individuals of the families investigated, excluding the center cases, showed evidence of tuberculous infection. In no case where there has been definite proven exposure of a family to an open case of tuberculosis has he failed to find a spread of the infection. In at least ten cases investigated the infection had spread to the limit of available material. Every member of these ten families showed evidence of tubercular infection. On the other hand, he concludes, "When no tuberculosis is found in a family the number of individuals showing evidence of infection is very small." Lampson's report is based largely upon the use of the von Pirquet test, and by its use other interesting results have been obtained, as those of Morris Fishberg,<sup>6</sup> who reports a study of all the children of the tuberculous applying for relief at the United Hebrew Charities of New York during a three months' interval. He reports, of 692 children, 67¼% gave a positive von Pirquet; the proportion of positive reactions during the first year was 15%; two years, 55%, steadily increasing to 74¼% during the period from the 11th to the 14th year.

Vedder and Johnson<sup>7</sup> summarize as follows: "A study of tuberculin tests in 1321 hospital children in St. Louis shows that the percentage of positive reactions reaches a maximum of 44% at the age period of 10 to 14 years."

The experience of Pollock<sup>8</sup> shows that 96% of the children in Vienna were infected before the 15th year, while Hamburger<sup>9</sup> states that 95% of the children in Vienna are infected.

Cahnnetto<sup>10</sup> found during the first year while only 9% were infected, that the percentage kept increasing until it was over 87% at 15 years. Reports from other large European cities show similar results.

Manning<sup>11</sup> of Seattle wrote as follows: "I made a careful clinical study of 228 children



coming to the tuberculosis division of the Seattle Health Department in relation to tubercular surroundings. Of 166 children with definitely known exposure to tuberculosis, 50.6% reacted positively to the von Pirquet test; 49.3% reacted negatively to the same test. Of the 62 children examined with a history of no known exposure, 22.8% reacted positively and 77.4% reacted negatively. Between 10 and 15 years there was the largest number of reactors, 58.1%."

Hillenberg<sup>12</sup> studied a prosperous agricultural community in Germany where no open cases of tuberculosis had been observed for years, yet he found one-fourth of the children between 6 and 14 years showed infection.

You will notice that Manning's results, as well as Vedder and Johnson's, are lower than those of foreign observers. But it is apparent, after studying American and foreign figures, that the proportion of infections increases from year to year till it must be admitted, even in our own country, by the time children reach 15 years of age half of their number have been infected, and most of these from some individual in their own family and not from outside sources. We must frankly admit our ignorance of the number of children infected in small towns, but admit by analogy the fact that there is a gradual increase of the number affected up to 15 years of age. On the other hand, as the number of the infected increases with age, the mortality diminishes. That is to say, the older the child, the better his chances when once infected. Thus Hamburger<sup>9</sup> would have us believe that while 80% of children infected before one year of age die, only 10 to 20% infected after two years die. LaPage,<sup>13</sup> from post-mortem evidence, states that the mortality rises during the first year, reaches its maximum in the second year, and then falls rapidly.

Rogers<sup>14</sup> says, "Before the age of two a positive skin reaction seems to be an indication that the child's life is likely to be short."

Wallstein and Bartlett,<sup>15</sup> after careful study of 1320 autopsies at the Babies' Hospital of New York, state that of the 178 tubercular lesions found, 75% were in subjects under two years of age and only 25% in the older children."

Morse<sup>16</sup> says a very small proportion of the children responding to the von Pirquet reaction, however, have tubercular disease. Those who are well and show no symptoms of tubercular disease are little, if any, worse off than those who have not been infected. In fact, it is probable that in many, if not most instances, they are better off in that they have established a certain immunity to tuberculosis.

Baldwin's<sup>17</sup> ideas have a broader viewpoint than the outlook for one generation. He believes that in the ultimate survival of those who acquire a relative immunity there will be a tendency to diminish the severity of the disease.

By inherited immunity the disease will be combated and reduced in virulence, so that after many generations its severity will be reduced. He believes that the opportunity for infection will react to the benefit of the human race by establishing a gradual immunity.

Fishberg<sup>6</sup> claims that by this method the Jewish race, which pays a very small toll to tuberculosis, has acquired a larger degree of immunity.

Authorities of today believe that the majority of tuberculosis begins in childhood, and the greatest hope for its extermination lies in the prevention of infection in childhood. This means that children must be guarded against infected members of the home circle and forces attention upon the sociological conditions of the child's life.

Where it can be carried out, as in tuberculous dispensaries, careful examinations and von Pirquet tests of all children in tuberculous families must be a part of the routine practice, and when children are in the pretuberculous or tuberculous state they should have the benefit of out-of-door life, general hygienic or sanitarium treatment.

Hess<sup>18</sup> would have New York erect preventoria where the children of tubercular parents could be kept free from the poison of the home life. Yearly physical examinations of all public school children are now customary, and one of the great results is the early discovery of the tubercular or pretubercular state. The principal difficulty is that with our present equipment the diagnosis may be made quite early, but we have not the machinery for treatment. The proper management of such cases at home, when sociological conditions are unfavorable, is indeed difficult and the tendency is to erect institutions to meet the conditions. Open-air schools, sanatoria and preventoria at present seem to be on the increase as a partial solution to the problem, and it is interesting to note that in New York there is a so-called Home Hospital, where a family in which a case of tuberculosis exists is moved to live under bettered conditions, in the hope of preventing the infection of the rest of the family, particularly the children.

It would be unwise to lay too much stress upon bovine tuberculosis when we are just beginning to comprehend the disease in human beings, but we cannot discuss the occurrence of tuberculosis in infancy and childhood without acknowledging a relationship between the two. While the great proportion of infection results from exposure to human cases, we must acknowledge that a certain number of cases originate from tuberculous cattle. It is hoped, however, that any attention drawn to this source of infection will not divert attention from the much larger and more important subject of human infection.

It is generally agreed that, whereas there is a certain relationship between the number of



people infected with bovine and human tuberculosis this appears to vary with age.

The greatest number infected with the bovine variety occur in infancy and childhood and do not increase with age, but this is not the case with the human type, which increasingly manifests itself in adult life.

If we concede that tuberculous infection takes place mostly in childhood, bovine infection assumes a new importance, and the warning of the Massachusetts Board of Health that milk from tuberculous cows is extremely dangerous for young children deserves greater attention.

The Massachusetts Board of Health says in its circular to our profession, "Furthermore, remember that milk from the cows is extremely dangerous for young children, and urge your patients to pasteurize their milk."

Many of us will have a prejudice against pasteurizing milk unless we know it is necessary. But a review of the literature on the presence of tuberculosis in cattle will convince anybody that the danger is a real one.

The United States Bureau of Animal Industry estimates that at least 20 to 30% of the dairy cows in our country are affected with tuberculosis, and I imagine these figures are not far out of the way for our own region.

The results of individual investigators, as well as the British Royal Commission on Tuberculosis and of the German Commission, show that, whereas pulmonary tuberculosis is practically always human in type, there is a considerable percentage of bone, joint, abdominal and lymph gland tuberculosis which is bovine in origin. Park and Krumweide<sup>19</sup> of the New York Board of Health, after collating the results of foreign and American investigation, declare a very high percentage of abdominal tuberculosis and cervical lymphadenitis is due to the bovine bacillus. The percentage of children infected varies according to different observers, but Orth says 10% of all tuberculosis in children is due to bovine infection.

An English observer<sup>20</sup> says "not less than 25% of the tuberculous children under five years of age suffer from an infection of bovine origin," while Rosenau<sup>21</sup> states "one-fifth to one-fourth of all cases of tuberculosis in infants and children are associated with the bovine bacillus."

In Park and Krumweide's series of 1511 cases of human and bovine infection, 12.5% of the fatal cases under five years were bovine. The cases show a high percentage of abdominal tuberculosis and tubercular cervical lymphadenitis due to the bovine bacillus.

The occurrence of the bovine type has been most easily and advantageously studied in infected cervical glands.

Mitchell<sup>22</sup> of Edinburgh, after studying 72 such cases, found 65 cases yielding bovine and only 7 yielding the human type. Eighty-eight per cent. of the children 2 years and under had

been fed on unsterilized cow's milk. Fraser, in the same city, in 100 cases of bone tuberculosis found 62% bovine and 35% human, while 3% yielded both types.

Meleher<sup>23</sup> studied the method of infection in 80 consecutive cases of tubercular cervical lymphadenitis, and found 88% bovine in origin, 12% human in origin. All of these children were under 12 years of age and 84% of those under 2 years of age had been fed on raw cow's milk. He concludes that the infection came from the cow's milk.

A. Stanley Griffith,<sup>24</sup> in a study of cervical gland tuberculosis, showed that the proportion of bovine infections was greatest in children under five years of age, namely, that 90% of such infections occurred under that age.

A. Philip Mitchell,<sup>25</sup> having previously studied the frequency of bovine tuberculosis in glandular tuberculosis in the children of Edinburgh, reported that on the bacteriological examination of 406 samples of milk collected from as many shops there were 82, or 20%, found to contain the tubercle bacilli.

In the present state of our knowledge, we are apt to think of two distinct types of tubercular germs, and yet that they have a certain relationship cannot be doubted. Their actions are similar and their biochemistry is certainly very similar. The two varieties have been found in the same individual. Tuberculin made from the two varieties seems much the same. It is perfectly comprehensible, and in fact a matter of every-day experience, that tuberculin cures certain cases of tuberculosis in human beings which are caused by the human type of germ. It seems equally comprehensible that a bovine tuberculin may cure lesions in man or beast caused by the bovine type. In both these lines experience will teach many practical points, and we shall all be interested as progress is reported. The value of the tuberculin of one variety in its action upon the lesions of another is only suggested by recent literature. At the Tenth Annual Meeting of the National Association for the Study and Prevention of Tuberculosis, Dr. Gililand<sup>26</sup> reported that he had treated cows with a vaccine prepared from human tubercle. (The work was conducted at the Experimental Farm of the Pennsylvania State Live Stock Sanitary Board.) The injections were given at varying intervals and in varying amounts. The vaccinated cows were exposed to infection by close association with badly diseased cows. When vaccination had been properly done the cows were apparently rendered immune but the unvaccinated cows died or developed large lesions. Dr. Gililand particularly calls to our attention the fact that it was the injection of the human type of germ which gave immunity to this group of cows, and believes that the experiments suggest a hopeful outlook, but does not prescribe any practical method of immuniz-



ing cows which can be advocated for ordinary use.

W. L. Moss of Baltimore<sup>27</sup> attempted to immunize calves against tuberculosis. Six calves of approximately the same age, weight and breed were selected from healthy, non-vaccinated cows. Three of these calves were fed from birth with the fresh mixed milk of several vaccinated cows. The three remaining calves were fed during the same period with an equal amount of fresh mixed milk from non-vaccinated cows, proved by the tuberculin test to be free from tuberculosis. At the end of several months all six calves were inoculated with a medium dose of bovine tubercle bacilli. The feeding of all calves was continued as previously until the termination of the experiment. At the conclusion of the experiment a necropsy was performed on one calf from each group and the lesions present compared. The calf which had received milk from immunized cows showed a small lesion at the site of inoculation, about 2 cm. in diameter, containing caseous material and surrounded by a thick fibrous wall. The related axillary lymph glands showed small caseous nodules and there were a few caseous areas in the bronchial lymph glands. The control animal showed at the site of inoculation a caseous abscess, 6 to 8 cm. in diameter, with a thin wall. The related axillary lymph glands were enlarged and caseous, as were also the bronchial lymph glands and those in the region of the gall-bladder. The liver contained from 15 to 20 caseous areas 1 to 5 cm. in diameter. The result of the experiment seems to justify the conclusion that a relative degree of immunity against tuberculosis may be conferred on calves by feeding the milk of vaccinated cows.

Clive Riviere<sup>28</sup> raises an interesting point. Assuming that the bovine type is less virulent than the human, he questions whether it is not doing useful work in protecting against the more virulent human type. He doubts whether we should not take measures to secure a mild bovine infection in the way of establishing a gradual immunity rather than leave our children to risk a first encounter with the infinitely more virulent human organism.

L. Sivori<sup>29</sup> reports that experiments on immunized cows show that antigens and antibodies are found in the milk, though not in such quantities as in the blood, and, furthermore, that animals born of non-immunized mothers show antitoxins and agglutinins in their serum, thus proving absorption of such bodies through the gastro-intestinal canal. He would have us believe that the protective substances in milk immunize against tuberculosis.

Julius Rosenberg<sup>30</sup> believes so thoroughly in the value of immunized milk that he glorifies its use, and feels so confident of its usefulness that he has supplied it free of charge to a number of physicians and hospitals. Some institutions have been supplied with the milk for five

months, and at the time of his writing he had 60 cases to report in which there was positive proof of the value of immunized milk as a remedy in tuberculosis of every type and degree.

If cows immunized against the bovine variety of germ can furnish an antitoxin in the milk which is at all efficacious against the human variety, another link in the chain which unites the two organisms is established. This is only one of the relationships which are being discovered under the searching eye of modern scientific methods.

After having drawn your attention to the prevalence of bovine tuberculosis let us approach it from the standpoint of research by Briscoe and McNeal,<sup>31</sup> based on studies of the herds of the Illinois Agricultural Experiment Station. They conclude:

"The results indicate that well-nourished cows which react to the tuberculin test but otherwise appear normal do not commonly pass tubercle bacilli in their milk. Furthermore, under good conditions of dairy management tubercle bacilli are not likely to be found in the milk of such cows when it leaves the dairy. A certain number of such animals, however, in spite of their healthy appearance, are passing virulent tubercle bacilli from their bodies and are, therefore, a constant menace to everything in their environment. So far as we know there is no practical means of distinguishing between these dangerously tuberculous cattle and those which merely react to the tuberculin test, but are not excreting the bacilli."

There appear to be two ways to avoid the use of milk containing tubercle bacilli. The first is the best in theory but impossible in practice. It would seem a very proper procedure to kill all animals that are proven tubercular by the tuberculin reaction, but from the standpoint of the farmer as well as from an economic viewpoint this is impossible of execution. The popular voice would never tolerate the destruction of capital necessary to such wholesale slaughter. The voice of science would also say that the tuberculin reaction is too uncertain to be a rational guide in such a procedure. Nobody in the present state of our knowledge would venture to diagnosticate all the cows infected or all the cows diseased, and for a long time make shifts must be adopted.

The tuberculin test is of use in certain private herds and selected dairies, and some people demand a certified milk from such dairies. This is only one step which shows that the people are gradually being educated to the desirability of a clean milk, but it does not prove that it can ever be carried out on a wholesale scale. Doing away with all the tubercular cows seems an utter impossibility, and we can never hope to see the day when the milk of tubercular cows is not offered to the public.

A more practical method is offered in pasteurization. The Massachusetts Board of



Health urges that this be commonly adopted, and in many of our dairies it is already in practical use. It is not an expensive method and it does away with many dangerous germs besides the tubercle bacilli. It is a good hygienic measure, which demands its general acceptance by the farmers as well as the endorsement of the medical profession.

## SUMMARY.

1. A positive von Pirquet reaction is a proof of tubercular infection.
2. Tuberculosis in the adult is the result of a song begun in the cradle.
3. Tuberculosis is largely contracted in the home circle.
4. The number of children infected increases with the years of age.
5. A von Pirquet reaction during the first two years of life signifies a bad prognosis, but the mortality decreases as the years advance.
6. Infection with small doses of the germs at infrequent intervals may gradually establish immunity.
7. Infection with the bovine type of tuberculosis occurs mostly in infancy and childhood, while the human type is chiefly manifested in adult life.
8. The bovine type manifests itself chiefly in disease of the bones and lymph glands of the neck and mesentery.
9. There is a possibility that the milk of immunized cows may be useful in the prevention and treatment of tuberculosis in the human.
10. Pasteurization of milk should be generally adopted.

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## Original Articles.

## FRACTURES OF THE LOWER END OF THE HUMERUS.

By W. E. LADD, M.D., F.A.C.S., BOSTON.

FRACTURES of the lower end of the humerus occur with much greater frequency in young patients than in adults. The treatment of these cases at the Children's Hospital has for some years past been fairly uniform. The majority of such cases have been put up in the position of acute flexion termed by Ashurst "hyperflexion." In general, reduction has been accomplished by manipulation only. In a small number, open operation has been resorted to, or a special variation in the position of immobilization, as indicated by the direction of the displacement of the fragments. For restoration of function, massage and passive motion have not been employed, but active motion has been relied upon entirely.

Upon such a general outline of treatment it has been interesting to compare the results secured here with those reported by other surgeons. For this purpose the routine records of the hospital have been studied, and in forty-five cases in which the records were complete and the skiagrams satisfactory, end-results have been secured.

For general consideration these cases have been broadly grouped as fractures of the internal condyle, fractures of the external condyle, and supracondylar fractures. Fractures which pass directly across the two condyles, termed diacondylar by many surgeons, have been classed with the supracondylar fractures. The principles of treatment in the two groups do not vary, nor is this fine anatomical distinction necessary for the interpretation of end-results.

In order to compare the end-results, standard terms of recovery must be adopted. A perfect result, as defined by Ashurst, Neuhof and Wolf, and others, is one in which the full range of motion is preserved and the carrying angle is normal.

An analysis of the work of a few representative surgeons seems more adequate for representing differing surgical points of view than a generalized summary of the entire subject.

The recent work of Neuhof and Wolf, advocating the value of early mobilization and massage, has been carefully gone over with reference to the type of fracture, the method of reduction, and the period of immobilization, as well as the after treatment recommended. The methods they advise are not in accord with either experience or practice here. Within my own observation, cases have occurred in which the size of the callus had been increased and the amount of motion limited by early passive motion and massage.

The practical difficulty to parent and child in



reporting daily for treatment is so great that it must be shown not only that good results can be secured by early mobilization, but that similar results are not secured without it.

The Neuhof and Wolf cases do not appear to me to establish the value of early mobilization and massage, and there is no small amount of intrinsic evidence in the study of their unsuccessful cases that callus is at times increased by the treatment. Their successful cases seemed to be the result of proper reduction and immobilization in the Jones' position, rather than the result of after treatment. To prove their contention, they should present cases put up in acute flexion after proper reduction, not having early massage and passive motion, and giving poor results. This they fail to do, and I have failed to find that such is the case from a fairly careful review of the literature, or from our experience. The high proportion of failure in their cases as a whole, 53%, may be ascribed partly to the fact that many cases were referred late after having been improperly reduced, or immobilized, by other surgeons, and possibly to unusually great deformity. The fact remains, however, that a comparison of the perfect and imperfect results shows that the imperfect cases equal or exceed the perfect cases upon mobilization and massage treatment in all groups except the one in which, in addition to the advantage of the Jones' position of hyperflexion, the cases presented in general slight displacements, generally posterior. One is unable to escape the conviction in the modern treatment of elbow fracture in children, that the imperfect results ought not to exceed the perfect results in any group which receives proper treatment, except that limited group which comes to operation for the correction of already established extreme limitations of movement.

Ashurst, in a comprehensive monograph published in 1910, points out reasons for the frequency of elbow fractures in children. That the age of the patient may be a factor determining other points than occurrence, is not emphasized. That the age is related to an early perfect result is at least suggested in our cases, and it is reasonable to suppose that the degree to which ossification in the bone has progressed, and the growth rate at which calcification is occurring, have a bearing upon the rapidity of repair as well as upon the ease with which fractures are mechanically produced. Treves in his work shows also that time through growth is to be counted upon to improve the immediate result, even where the reduction is imperfect, which finding is substantiated by some of the cases here.

With growth, slight bony prominences from unreduced displacements, or callus, may be removed sufficiently to allow free joint action. The time which elapses before a perfect result is reached is difficult to state, as patients generally fail to report further when a fairly satisfactory result is reached, and the final perfect

result in the majority of cases is seen when the surgeon makes a special examination for the purpose of gathering data.

Ashurst's paper is singular in the report of but one operative case. In the work here we have found that the cases which have proved irreducible by manipulation only, for which we have come to adopt open reduction, are typical in the degree or direction of displacement initially presented in the fracture. Among Ashurst's cases, the two imperfect results in diacondylar fractures, and the one imperfect result in fractures of the external condyle, suggest in the data offered that operative treatment would have been followed here. Two of these, Cases 23 and 33, involved apparently marked displacement of the external condyle; the third, Case 24, a diacondylar fracture with rotated anterior displacement into the joint, shows evident imperfect reduction in the last skiagram after hyperflexion. This belongs in the group for which an internal angular splint, or open reduction, has been found essential here. The results secured by Ashurst by hyperflexion, though not perfect, are excellent under the conditions involved, and the claim is not advanced that better results would have been secured in the clinic here.

In the French literature, the work which has proved most interesting for a special examination of the cases is the monograph of A. Treves, published in 1911, which includes reports of some cases of Mouchet, Kirmisson, and Broca.

Treves' monograph was undertaken primarily from the point of view that late results (*resultats lointains*) of elbow fractures in children were probably more successful than the immediate results, and that limitations of motion to a certain extent gradually disappear, and that the use of passive motion and massage is disastrous to hasten processes which even under conditions of imperfect reduction ameliorate themselves with growth and natural use.

The report reviews 79 supracondylar fractures with 68 perfect results; 42 external condyle fractures with 34 perfect results; 34 internal condyle fractures with 22 perfect results; a total of 155 cases with 88% of perfect results. The cases show a systematic roentgenological study from the first x-ray for displacement to the final skiagram of end-result. The determination of a perfect end-result differs slightly from the one adopted by American writers. A result is classed as perfect where the range of motion is practically complete and the variation in the carrying angle is not sufficient to be a noticeable deformity. A decrease in range of motion, or a positional deflection, therefore, which requires special examination for its detection is treated as negligible, which for all practical purposes is correct.

The treatment in the French cases in many ways coincides with ours. Treves and his colleagues advocate reduction and immobilization in acute flexion in the majority of cases, never





PLATE I.—Supracondylar fracture with rotation, lower fragment.



PLATE II.—Lateral view of same case as Plate I three weeks after open reduction, showing good position and callus.



PLATE III.—Same as Plate II only antero-posterior view.



PLATE IV.—Supracondylar fracture with marked inward and backward displacement. Reduced by open operation.



PLATE V.—End-result of same case as shown in Plate IV one year later.



PLATE VI.—Supracondylar fracture with anterior displacement. The exceptional case for which acute flexion is obviously not applicable.





PLATE VII.—Same case as Plate VI, showing a satisfactory alignment obtained with an internal angular splint.



PLATE VIII.—Fracture of external condyle with rotation of the fragment.



PLATE IX.—End result of case shown in Plate VIII after reduction by open operation.

use massage and passive motion, believing it to be never valuable and frequently harmful. His belief as to operative interference we should usually agree with as regards the type of case, but not as to the time operation should be performed, when necessary.

Personally, Treves does not advise operation except as a last resort from six months to a year after the original lesion, when faulty union has definitely occurred, or in special cases when a nerve is involved. The operated cases given, however, show excellent results from the point of view of improvement, but retain some persistent limitation very generally.

Broca, Monchet, Destot, Vignard and Barlatier advise operative treatment in external condyle fractures where displacement is markedly forward or rotation of the fragment occurs, which agrees with our practice here. Kirmisson and Treves do not agree to this as an immediate resort.

Concerning fractures of the internal condyle, he reports "absolute restoration is more frequent than in any other group," which coincides with our limited experience in this type of fracture here.

From a critical point of view, the following cases from the surgical clinic of the Children's Hospital, and my own practice, have been studied and are presented.

There are 25 cases of supracondylar fractures with 21 perfect results, one of six months' duration, still improving, but with a remaining present limitation of five degrees in flexion, which experience indicates can be added to the perfect results; one operative case involving an ischemic contracture, duration one year, still improving, with a present limitation in extension of 15 degrees. This case at present remains uncertain in its final result, and has been excluded from percentage computations until it can be classed in one group or the other. There are two imperfect results. A total of 84% perfect results have been secured, with a probability that 92% of the cases will be eventually perfect.

An examination of these cases shows that all cases of slight displacement or no displacement gave perfect results; that the four cases operated upon by the writer because the displacement was irreducible by manipulation have given perfect results except for a very slight valgus deflection of the carrying angle in two cases, so slight that I feel quite satisfied to consider the arm perfect. These four cases presented the most serious types of supracondylar displacement.

The two imperfect cases involved special conditions. F. McW., entered the hospital six months after the original fracture for the operative correction of established deformity. A marked adductus varus existed and a range of motion reported as between 1/3 and 1/4 of the normal movement. A wedge-shaped piece of bone was resected to free the external condyle and free the obstruction of the olecranon fossa. I have recently examined this case



eight years after operation. It shows excellent improvement upon the original condition. There is a valgus of five degrees and a limitation in flexion of 10 degrees. (Surgeon, Dr. Burrell).

The second case, E. R., came in with a fracture of the radius and ulna as well as the supracondylar elbow fracture, and with very marked swelling of the arm. Acute flexion could not be used immediately. The correction of the wrist fracture is perfect, and the only loss of motion is 15 degrees in flexion. It is two years since the reduction, and it is possible that the flexion may improve slightly with growth.

A study of the displacement in the group shows it to have been serious, or to have presented special difficulty in 16 out of 24 cases (F. McW. omitted), or in 66.6%, and that in the cases of serious displacement it was possible to reduce three out of every four practically without operation. While acute flexion was used in the majority of cases, an internal angular splint was applied under special conditions in two cases with perfect success. (See X-ray Plates VI and VII.) After reduction, the period of immobilization was determined independently in each case, depending upon the judgment of the surgeon in charge. There is no case in which the period was under three weeks, and none in which passive motion or massage was used.

The cases of external condyle fracture were 16 in all, in 15 of which, or a little more than 93%, perfect results were secured. Of these cases, 6 presented practically no displacement, and 2 very slight displacements. The remaining 8 presented difficulties in reduction, and in 5 of this number the displacement was considered irreducible and open operation was resorted to.

The one unsuccessful case in the series, F. J. C., entered the hospital four months after the original fracture with deformity of the arm and extension limited to 45 degrees. Operation was recommended and was not accepted until ten months later (14 months after fracture). A marked improvement was secured. The arm is limited 20 degrees in extension and has a slightly increased carrying angle and some atrophy of the hand and forearm. This case presented in its initial condition the displacement for which we recommend immediate operation, and was identical with the other four operated cases in all facts except the postponement of operation until long after faulty union had occurred.

The proportion of operated cases is higher in the group of fractures of the external condyle than in any other group. These operated cases present that group upon which the rotation and displacement of the fragment is so serious that no other form of reduction is satisfactory in our experience. The fractured surface of the condylar fragment (See X-ray Plate VIII) is turned upward and outward with general downward displacement. The rotation of the fractured surface of the fragment away from the humeral end makes a return to position, without

entering the joint, practically impossible. This type of fracture was first recognized here by Dr. J. S. Stone, and the technique of the open reduction advocated was developed by him. All of the earlier cases were operated upon by him and to him are due the four perfect results in cases operated upon immediately, and the excellent result from the point of view of improvement in the fifth.

The internal condyle fractures were five in number, and a perfect result was secured in each case. In only one case was the displacement a factor of any difficulty (H. E. C.). Since the fragment came forward into the joint, an internal angular splint was used. The recovery of perfect function was slow. Fourteen months after reduction there was a persistent limitation in extension of 10 degrees. Called in for special examination eight years after injury, the arm was found to be perfect in every respect. The factor of growth emphasized by Treves probably entered into the removal of the limiting prominence and the return of perfect function.

Massing the cases without respect to type, degree of displacement, or special details of after treatment, forty-one perfect results, three imperfect results, and one untraced case of excellent promise one month after treatment have been secured, so that in slightly more than 91% of the cases, a perfect arm has been secured.

The outline of treatment used in these cases has comprised x-ray as well as clinical examination before reduction for the accurate determination of displacement. Reduction by manipulation in all cases amenable to this process. Immobilization in hyperflexion unless swelling of the arm or other fracture complications prevents the most acute position and necessitates some degree of extension. (E. G. and L. P.) In special forward displacements an internal angular splint has proved very effective in securing and maintaining position. Immobilization for a period of three weeks or over. The avoidance of massage and passive motion in after-treatment. The encouragement of natural use of the arm by the child to insure the return of function, with the reliance that the instinctive avoidance of pain will restrict undue movement so long as necessary. Non-interference with a persistent slight limitation in movement, which experience shows that growth will eliminate in time. For displacements which are irreducible, operative reduction is practised immediately after the injury, before swelling has taken place, or a few days later, when the swelling has had time to subside. The operation as practised by us consists in making an incision over the external condyle and carrying it into the site of fracture. In the cases of rotated external condyle fracture, the fragment is rotated back to its normal position and the arm placed in the position of acute flexion which has proved adequate for keeping it in place. In supracondylar fractures a similar incision is



used, and the distal fragment is pried down into place with a blunt dissector or other suitable instrument. The arm is then immobilized in acute flexion. It has never been found necessary to use silver wire or other appliance to hold the fragments in position, and we deem it very unwise to introduce any foreign body at a centre of growth.

From this analysis it is seen that the practice pursued in our clinic and in those of Ashurst, and Treves and his colleagues is very similar, the only difference of importance being that we resort to open operation occasionally in cases that Ashurst would not, and that in those same cases we resort to operation soon after the accident, rather than delaying for six months or a year, as would Treves. With this practice Broca, Mouchet, Destot and others are in accord.

In conclusion, we may state that after a careful study of the work of Neuhof and Wolf, we do not believe that their conclusions are correctly drawn, nor that their results justify the adoption of early passive motion and massage as valuable treatment. That the result of our operative interference in a few selected cases to some extent justifies its employment. That acute flexion is the position of choice for immobilization of the great majority of fractures of the lower end of the humerus, and that when not applicable, common sense will dictate what position and apparatus should be employed to secure proper alignment of the fragments. That from three widely separated clinics, cases treated upon general lines of similarity have yielded approximately 90% of perfect results; and that a fracture of the lower end of the humerus in a child treated properly should result in a perfect arm in nine cases out of ten, and a useful arm in practically every case.

### THE MASSACHUSETTS TUBERCULOSIS DISPENSARIES AND THEIR RELATION TO THE PRACTISING PHYSICIANS.\*

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ON June 22, 1911, the following Act was approved by the Governor of this State.

"Be it enacted, etc., as follows:

"Every city and town containing a population of ten thousand or more, as determined by the latest United States census, shall establish and maintain within its limits a dispensary for the recovery, treatment and supervision of

needy persons resident within its limits and afflicted with tuberculosis, unless there already exists in such city or town a dispensary which is satisfactory to the state board of health. The said dispensaries shall be subject to the regulations of the boards of health of the cities or towns in which they are respectively situated. A city or town subject to the provisions of this Act which, upon the request of the state board of health, refuses or neglects to comply with the provisions hereof, shall forfeit not more than five hundred dollars for every such refusal or neglect."

In 1914 this Act was amended by providing that the said dispensaries "shall be inspected by and be satisfactory to the state board of health."

No effort was made to enforce this law until 1915, when notices were sent out that cities and towns refusing or neglecting to comply with it after a given date would make their explanations to the attorney-general. A list of minimum requirements which would be satisfactory to the state department of health was sent to each city and town that came under the provisions of the law, and the district health officers went to work explaining, persuading and urging the authorities to action. As a result, on the date set, every city and town concerned had established a more or less effective dispensary. Some got excellent results at once and appreciate the value of the institutions; others haven't seen it clearly as yet. The medical profession is, perhaps naturally, suspicious of a "dispensary," and I wish to explain here what the intent is in this so-called "dispensary plan," and what its relation should be to the practising physician.

The procedures for the protection of the public in the ordinary run of communicable diseases are well known. The diseased person is so isolated and cared for that opportunities to spread the disease to others are reduced to a minimum. Persons exposed to and liable to develop the disease are quarantined and watched until the period of incubation is past. Tuberculosis is exactly like any of these diseases in the fact that it is communicable. It is transmitted from one person to another, probably usually by contact, just as they are, and the same methods of protecting the public would be exactly as effective. But tuberculosis, instead of being an acute trouble, is usually chronic and of long duration; the period of incubation may be interminably long, a person may be infected for many years before he shows signs of being diseased; instead of being an epidemic disease it is endemic, and nearly the entire population are tubercular at some period in their lives. The character and history of this disease makes its control a very different problem from that concerned with diphtheria or scarlet fever. The principles are the same, but their application in the same way would put so large a per cent of the population into quarantine for so long a

\* Read before the Medical Societies of Northampton, Holyoke and Westfield.



time that their support would be a financial problem of magnitude. For these reasons our method of procedure must be modified.

Tuberculosis occurs in many forms. The one with which we are chiefly concerned is the pulmonary type. Other forms,—glandular, bone, skin, abdominal, etc., claim many victims, but are not the commonly transmitted, danger to the public that the pulmonary type is.

From the public health standpoint, persons actively or potentially a public tubercular danger may be divided into three classes. These classes are not sharply differentiated; they overlap and run into each other more or less, but still, for practical purposes the distinction holds pretty well.

*First.* The definite open cases, the "advanced" cases, where the bacilli are being thrown off to the extent of being demonstrable. Those in this class are usually pretty thoroughly diseased, and a large per cent. of them either do not recover, or get well with a permanent handicap.

*Second.* The "incipient" cases, diseased but not throwing off bacilli in demonstrable quantities. These are the favorable cases, with excellent prospects of making good recoveries under proper care.

*Third.* The exposed and probably infected, but not yet diseased persons. This class contains the members of the family and the close friends of the other classes, who have been exposed to infection. They may be able effectively to resist this infection. They may hold it dormant for years and unexpectedly develop tuberculosis after some physical depression. They may develop it quickly and pass into the other classes.

As stated above, there can be no sharp distinction between these classes. If rated on laboratory findings alone, a case classed as "advanced" may not be so extensively diseased as another classed as "incipient," because of the superficial location of the ulcer that is pouring out germs in the one and the deep location of the cavity that is confining them in the other.

For the *first class* we have hospitals. Many cities and one county have their hospital, where the patients are largely bed cases, where they are made as comfortable as possible, where those who can recover are given their opportunity, where friends can readily visit them, and where the "open," dangerous cases are removed from the possibility of infecting their children and friends in their homes. There is at present a movement on foot to establish hospitals in all sections of the State for the accommodation of those cases comparatively near their homes, and the consequent relief of the sanatoria of their present burden of advanced cases.

For the *second class* we have sanatoria. These are located in comparatively inaccessible places, where the excitement of visitors can be kept at a minimum and the favorable, "incipient" cases

can be given their opportunity for recovery. The sanatoria are at present loaded with too great a proportion of cases of the first class. The Rutland Sanatorium, for example, where every effort is made to limit the admissions to the more favorable cases, has about 50% of its beds occupied by "advanced" cases, very effectively shutting the doors of the institution against numbers of the very class of patients for whose benefit the Sanatorium was established.

With these two weapons we have been fighting the disease after it had come into the open, but until now we have taken no public measures to protect and aid those exposed and probably infected, but not yet diseased.

For this *third class* we have established dispensaries. The name is unsatisfactory. A "dispensary" is commonly understood to be a place where people come for *treatment* when they can't afford to pay for it. You know well the uselessness of ordinary "treatment" in tuberculosis, and the State does not purpose to foster quackery. To the physician a "dispensary" often means a place where people get for nothing, things for which they could at least pay him a part of the usual fees, and he looks on it as rather his enemy than his friend. If the tuberculosis dispensary is primarily intended to supervise the third class of patients, viz.—those exposed and probably infected but not yet diseased, it is evident that treatment cannot be a very important part of its work. A certain number of diseased persons will certainly come for treatment and will get it, but that is not the main end and object of the dispensary.

Each dispensary should be a complete reference library of general tuberculosis information and of local epidemiological facts, provided with proper equipment, both material and personal, for the application of this general information to the local epidemiological facts recorded there.

If a case of diphtheria is reported to a local board of health, certain facts should be, and generally are, recorded there at once. Where does the patient live, what are the home conditions, can he be isolated there or must he be removed to a hospital, who have been exposed to the case, where do they live, and what is necessary to do in order to keep them under observation during the period of incubation? Tuberculosis is also a communicable disease, transmitted in about the same way, and is a greater factor in the death returns; but how many of these epidemiological facts in regard to it do you find on record? Usually the date, the name and address of the patient and the name of the doctor reporting it. Often you will find that the death certificate was filed within a few days of this report.

To fight tuberculosis successfully the conditions surrounding each case, and the probable channels of infection from it, must be known and watched, and this is the function of the dis-



persary. It should be the tuberculosis clearing-house of the community. There every one who has a right to the knowledge should be able to turn at once to every detail of epidemiological information necessary to combat the spreading of the infection from any given case. This information must include all pertinent facts regarding the actual case, and also the facts concerning all persons who are and who have been exposed to it so that they may be advised and supervised during the long period of incubation.

The material and personal equipment for the dispensary, as worked out by the state department of health is as follows:

In the circular letter sent to the cities and towns coming under the provisions of the law, a statement of minimum requirements was made. These included a set of uniform printed blanks for records, a simple office equipment, required two rooms with certain conveniences, the attendance of a properly qualified physician for examinations, advice and treatment, and the employment of a dispensary nurse. The estimate of the relative value of these requirements might be stated as, 5% office and equipment, 15% physician and 80% nurse.

The dispensary should be centrally located in order that patients may get to it readily. In most places special rooms have been provided, and often these are in direct connection with the offices of the board of health. Other things being equal, this last arrangement has been a very satisfactory one.

The office equipment called for is sufficient to insure the comfort and convenience of both the officials and the patients, to provide a complete and quickly available system of records and a safe place for storing them.

The part of the physician is an important one. He must be qualified to make pretty delicate differential diagnoses, must be sufficiently interested in the work to stand up under the routine, and must be of such a character and with such a reputation for square dealing among his fellow practitioners that they will not be afraid to send their patients to him for examination. The majority of his duties will lie among those who cannot afford to pay much money for their medical work. Still, no physician can tolerate the alienation of any patient, therefore the man in this position must be one whom the other doctors can and do trust, not only to be square in the matter of diagnosis, but also not to damn them with faint praise or by deprecatory remarks. He must have a large knowledge of human nature. Persons coming to the dispensary for advice and treatment will be, in a large number of cases, of the uneducated, suspicious type. Many of them, the majority perhaps, will be those who are not then sick, but who are protected against being sick in the future, and who will not really believe that they are in any actual danger. At best, it will not be an easy and simple process to get these people to attend with the desirable regu-

larity and frequency. The attitude and the diplomacy of the dispensary physician will often be the crucial factor with them. If they feel that they are getting anything of value from him, either in medicine, sanitary advice or even in cheering and interesting words, they will be more easily induced to keep coming. They may think it is a fool proposition, but the nurse can get them there if there is anything in it for them from their own standpoint. If, however, the doctor is of the wrong sort, it would take a bench warrant to get them there more than once.

The qualifications of the dispensary physician and nurse are as much under the supervision of the state department of health as is the rest of the dispensary equipment. In one city it was suggested that the office of dispensary physician be included among the duties laid by ordinance upon the city physician. This plan was disapproved because city physicians come and go, and a man might well be elected to that office who would be worse than useless in the dispensary.

We allowed an 80% valuation to the nurse, for it is chiefly through the work of the nurse that the information is to be obtained, the information that is the foundation on which the whole dispensary work is built.

"Nurse" is a poor term. She is not really a "nurse," she is a combination of clerk, social worker, directory of sources of available aid, co-worker with every benevolent association, close friend of the patient and his family, employment agency, and the personal agent of every doctor in the community. She must know all about every case in her bailiwick, not only the actual physical condition of the patient, but also the family financial and social conditions that play such an important part in this sickness. This does not mean that she is to drag every case and its contacts to the dispensary, and have them examined and advised there. Such cases as are referred to the dispensary by the board of health, by associations or by physicians, as needing the attention but not able to pay for it, should be examined, watched and advised there. Those who can and do pay their way with their own physicians should, of course, be watched and advised by them. No dispensary nurse should ever go to visit a private case without the previously obtained permission and advice of the physician in charge. If he thinks that for any reason whatever it would be unwise for her to go to any particular case she should not go there. She should get from this physician the facts needed for her records, both concerning the case and the contacts, and get them at reasonably frequent intervals. The physician will soon find that instead of taking work away from his, she is increasing his work in that family. He will make more frequent examinations in order to give her the facts she keeps pestering him about, and what he realizes he ought to know. When a family tells her to



go ahead and visit his patient, he will find that she is constantly urging that patient and family to come to him regularly for examination and advice, that she is his agent and coöperator, instead of an enemy to his pocketbook.

All doctors have some semi-charity patients on whom they cannot afford to spend the time that really ought to be devoted to them. If they send these to the dispensary for regular examinations, with a note or a telephone call to the physician explaining the situation, they will find that the report of the examination will be sent direct to them and that medical and sanitary advice will or will not be given to the patient, exactly as they may direct. No man's patients will be alienated from him; on the contrary, his patients will be advised to go to him at regular intervals, in all probability more frequently than has been their habit.

The nurse, in coming to physicians for details concerning the cases they report to the board of health, is not trying to butt in, she is trying to complete the official information on a public danger, and it is well within the rights and duties of a board of health to ask for such records. They are the base of our plan of campaign, the reports of our intelligence division.

It has been believed for some time that we have about all the laws we need for the control of communicable disease. True, the courts will not allow us to apply them in all cases, notably against incorrigible consumptives; nevertheless, we feel that we cannot get much further with control by laws alone, that our future advances must be by the education of the individual in disease prevention. No one has ever had such an opportunity for placing so much information in the very spot where it is most needed as the dispensary nurse will have. She will be at the focus of the disease, damming its ordinary channels of communication and spread. Her advice to the diseased and to the infected people will be given by the direction of and under the oversight of the dispensary physician or the private physician, according as the case is a dispensary or a private one. Her advice will carry weight and be followed in just the proportion that she has been able to gain the confidence of that family and its physician, and the results of her work in stamping out this disease ought to be little short of marvellous.

She will have information that will be of the greatest value to physicians in their work, information covering the character, methods and red tape of all the institutions in the state, both public and private, that care for tuberculous cases. Tuberculosis is a prolonged, expensive disease, and in many instances, a family who could perfectly well handle the finances of a short, acute disease will need help in this situation. The nurse will know where help is and how to get it.

You see why we estimate the nurse's work at 80% of the dispensary. She has to be a person

of peculiar abilities; no fool need apply. Any one who has to insinuate her friendship into a sensitive, sick family and at the same time keep on terms of open confidence with our touchy profession has no bed of roses. A shut mouth is one of her most valuable assets, and that is not a common human attribute. The doctors can make her work easier when she comes to them or they can make her life pretty miserable and her work very discouraging. It is a hard job at the best and calls for about all there is in a woman—no man could do it.

These descriptions of the dispensary doctor and nurse are, of course, of the ideal. No mere human being could be so comprehensively all things to all tuberculous people as would be the case in a perfect institution of this sort. But as a matter of fact, those now in this work come much nearer the measure of this ideal than you would believe possible. None of them escapes shortcomings along some of the lines, but all of them have their extremely valuable qualifications for the work. They are working hard and are getting results, and, from a clearer understanding by physicians in general of the intent and scope of this branch of the work, there should come a fuller measure of coöperation and a correspondingly greater harvest.

In the past we have been going after tuberculosis from one end and in the middle; we believe that through this dispensary work we shall be going at it from the other end also. The record of the fight is good now; we are reducing the gross amount of the disease, but the wiping out of the remainder will be the hardest part of the work.

The dispensary is established to reach the class of persons not provided for by the sanatorium or by the hospital,—the class of exposed and presumably infected people. Treatment of diseased cases there is a small part of its work. Its greatest service to health officials will lie in its recorded facts covering the situation, physical condition and mode of life of diseased persons who remain in their homes and of those persons who have come in contact with tuberculous cases. Its greatest service to the public will be shown in the improved hygienic conditions in infected households, due very largely to the advice given there by the dispensary nurse. It is believed that the dispensary plan will be of great assistance to the physician and not in any way a hindrance to him. In order to get the best results from its work, the coöperation of the medical fraternity as a whole is needed, and we hope to have this in full measure.

The anti-tuberculosis societies, in combining their social service work with their material and medical attendance, were working along this same line. We hope to be able to carry it still further and get still more complete results by putting this work directly under the authority of those whose official business is to protect the public from disease.



## A YEAR'S WORK OF A LOCAL TUBERCULOSIS HOSPITAL.

BY ALBERT C. GETCHELL, M.D., WORCESTER, MASS.

THE Worcester Tuberculosis Hospital is an addition to a hospital plant the City of Worcester has maintained for several years for the treatment of diphtheria and scarlet fever under the care of the Board of Health. Before this addition was made, it was called The Isolation Hospital. It is now the Belmont Hospital. The name indicates its situation, on a fine hill. Belmont Street is the name of the street on which it is located and "Belmont Street" is the sign on the street car that goes directly to the hospital. The Tuberculosis Building is named the Putnam Ward, in honor of Mr. Henry Putnam, who gave to the city the land on which the building stands.

The building is a substantial brick structure, two stories in height, facing the south. It consists of a central building, in which is the administrative office, an assembly hall, and nurses' living rooms. A wing extends from this building to the west, which is the hospital. The complete plan calls for another wing, extending to the east. Each floor of the medical building has one four-bed room, two two-bed rooms, four one-bed rooms, a sun room with abundant window space, one open ward for sixteen beds, service rooms, and out-of-door porches.

The administrative and medical staff consists of (1) the board of health, the office and laboratory of which is at the City Hall, and is also the headquarters of the tuberculosis nurse; (2) The superintendent of the hospital, who has general charge of the local administration and is the local medical officer; (3) A visiting physician, who makes a visit each week day, seeing every patient on each visit, and makes and records all physical examinations; (4) One male supervising nurse and twelve female nurses.

An out-patient department is maintained at the hospital. This serves as a place for examination and advice for patients discharged from the hospital, patients referred by the city tuberculosis nurse, those referred by other clinics and physicians, and such other poor persons as wish to come for advice and treatment.

Before the hospital was opened, the board of health established the policy that only such persons as had tubercle bacilli in their sputum were eligible for admission. This decision rested on two grounds: first, that the hospital was built and maintained by the city primarily as an instrument of public health, and that bacillary patients only were a danger to the public; and secondly, that it is impossible absolutely to determine that a case of pulmonary disease, especially chronic disease, is tubercular without the evidence of tubercle bacilli. It is not necessary that the sputum be found positive at the time of application. If there is a record of positive sputum at the board of health office, the appli-

cant is eligible. Besides this record a report of positive sputum from the laboratories of the four state sanatoria is adequate. This rule has been held to except in a very few instances of sudden emergency like severe hemorrhage, when the patient could not be taken immediately at the City Hospital, and cases of evident consumption under destitute surroundings. The results thus far have justified this policy and there is no disposition to depart from it.

The hospital was intended primarily for advanced and dying cases and those cases are given precedence of all others. But if there is room, the early curable case is admitted and kept until it can be taken at Rutland. This is a very important work. Suitable daily supervision of all the details of a patient's life, in the interval of ten weeks to three months after application is made before the patient is taken at the sanatorium, spells the success or failure of the cure.

The capacity of the hospital is 55 beds. At present this seems to meet the needs of the city. Very few patients have been kept waiting for admission and all whose needs were urgent have been admitted at once.

It appeared early that many more men applied than women, and the open women's ward upstairs was given up to the men, the relation of men and women being about 43 to 12.

The hospital being built and maintained by the city, it is evident that it be reserved for the bona fide city case and others be admitted only as excess population, or by special arrangement satisfactory to the city, which means that cases having a settlement in other towns in the state shall be suitably and adequately paid for by those towns, and that state cases, able to be moved, and whom it is not convenient for the hospital to care for, be removed by the state to another place. I am sorry to say that neither of these conditions has been satisfactorily fulfilled. Of the 148 patients treated during the year, 51 were not citizens of Worcester.

The discipline of the place has been and is a matter of careful, not to say anxious, thought. The problem is a difficult one. The hospital was built and is maintained by the city at considerable expense and the city, if for no other reason, has a right to look for adequate returns for its outlay of money. No work, public or private, goes by itself. System, order, and control are essential in every activity of life, and particularly in those activities involving the welfare of a group. The purpose of the hospital is twofold: to protect the community from the tubercle disease and to relieve suffering humanity. The difficulties to be encountered in carrying out the physical condition of the patients are many. Many of them are not skilled in the use of the bed and their activities must be carefully supervised. Some have no money to buy food or clothing, and have been in the hospital for months. All these conditions are to be met, and the strain of a continuous effort for the patients' benefit.



own good as well as that of others, and of the institution as a whole. On the other hand the hospital is a place of last resort and, whether the final illness be brief or prolonged, it is the last home that many will have on this earth. So far as any public place can be a home this should be one. The patients should have constant, skillful, sympathetic, kindly care. No effort should be spared to prolong life, or, if that is impossible, by assiduous attention to give the patient, who feels his life slipping away, the comfort of human sympathy and support. The scheme of discipline is based upon the foregoing considerations, and while it is intended to allow the largest freedom compatible with hospital efficiency, the limit of that freedom must be respected on pain, it may be, of summary dismissal. The plan has worked well and we feel convinced that it is the best plan, not only for the hospital, but for the patients, and the safe-guarding of public health.

The number of patients treated during the year was 148—106 men and 42 women. Except one child who was kept at the hospital pending other disposition of her, all were over 14 years of age. Of this 148, 84 had a Worcester settlement, 16 a settlement in other cities and towns of Massachusetts, 43 were state cases, and 3 had settlements undetermined; 3 were classified incipient, 56 moderately advanced, 87 advanced, and 2 non-tubercular; 62 died in the hospital, 9 were transferred to state sanatoria, 9 eloped, 12 men returned to work, 2 were discharged for drunkenness, 15 on request, though they could properly have remained longer, and 16 were discharged against advice. Some of these have died outside during the year, and this number, if it could be known, should be added to the 62 who died in the hospital.

In the out-patient department 140 patients were treated.

The treatment has been hospital treatment modified to meet particular cases. We have not to any extent employed so-called specific treatment such as tuberculin and artificial pneumothorax. The whole hospital has the open window much more than a general hospital. Patients are classified according to their particular needs. Feeble elderly persons with stationary or slowly progressive disease are made as comfortable as possible, relative to the open windows. Those also who have pronounced asthmatic symptoms graduate the open window according to their comfort. The ambulant patients—and they are mostly men—have their beds in the large wards which serve as dormitories. Other patients, as their condition requires, are put in the smaller rooms. Advanced cases near death, particularly if they have been to sanatoria, demand the open window, and the open window is used with others unless they are definitely more comfortable without it. All patients who have a reasonable prospect of either cure or material improvement are closely supervised as to out-of-door life during the day and

the open window at night, and regulated exercise as well as their feeding.

We have carefully studied tuberculosis of the larynx. The larynx of every patient is examined on admission, and once every two months during residence, whether or not there are symptoms. Chest examinations are also regularly made at these times. At any time, however, if there are symptoms, a laryngeal examination is made. Nearly every patient has been examined. Those who have not were those who lived but a few hours after admission, and their condition was such as to forbid examination. Twenty-five had on admission tubercular involvement of some part of the larynx or of the epiglottis, and five developed tuberculosis of the larynx during residence. All these died. Treatment has consisted of complete rest of the larynx by non-use of the voice and systematic general care. As these patients are usually very sick, this is not difficult to carry out.

Local treatment we use as little as possible, and only for symptoms, particularly pain and dysphagia. It is an interesting fact that relatively a few have had pain. Although I know of the laryngeal condition, as a rule, I do not tell the patient of it, and while I ask the attendant often as to pain, I never ask the patient until the information has first come from him. Less than one-third of the cases, I should say, have had pain, and some who have had pain were free from it as they neared the end of life. For the relief of pain we have found inhalations of menthol, anesthesin lozenge, two per cent. cocaine spray, and the injection of eighty per cent. of alcohol into the superior laryngeal nerve useful.

I would not imply by what I have said that more active treatment of laryngeal tuberculosis is ineffective. Indeed our experience with galvano-cautery and the removal of the epiglottis in patients at the Rutland Sanatorium proves the contrary. But in none of these cases have I considered these measures advisable, except one,—a patient who had extensive laryngeal and little lung disease. Hoping that the removal of his epiglottis would relieve his dysphagia and give him a chance for life, I operated on the epiglottis. But it did no good. The disease rapidly extended even over the pharynx and he died.

We have also studied the relation of nasal trouble and tonsils to the pulmonary and laryngeal disease. We have observed no greater incidence of laryngeal tuberculosis in obstructed noses than in unobstructed noses, and we find that enlarged tonsils and history of tonsillar trouble is comparatively infrequent.

The most impressive lesson we have learned is that far advanced pulmonary and laryngeal disease is not incompatible with the ordinary activities of life. We have had several patients, mostly men, who gave a history of only a few days and at most a few weeks' illness, but who were found on admission to have extensive pulmonary and laryngeal disease and lived but a short time.



## A SUGGESTION AS TO THE PREVENTION OF INFANTILE PARALYSIS.

BY W. STEWART WHITTEMORE, M.D., CAMBRIDGE, MASS.

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THERE has been much criticism of the medical profession because of its failure to give out to the public definite advice as to how to prevent infection with infantile paralysis. All the measures which have been suggested thus far have been of the vaguest kind, such as washing the hands before eating and keeping children away from any child who is known to be sick. This criticism is the more justified because those in charge of the fight against the epidemic of infantile paralysis in New York have given the public the impression that we know all about the disease and that there is nothing to warrant alarm on the part of parents. In spite of such reassuring statements, the number of cases has steadily mounted to over five thousand, and the end is not yet in sight.

How much better it would have been to acknowledge frankly that we are in great ignorance as to this disease, which has been studied seriously for less than ten years. We do not yet know what the incubation period is nor how long to isolate a patient after the active symptoms have subsided. To avoid further misunderstanding, the public should be taken into our confidence in this matter and asked to be patient while we experiment with various methods of preventing the infection.

I wish to offer a suggestion as to a possible method of preventing children from becoming infected with infantile paralysis, in the hope that it may be tried out to determine whether it is of value or not. About a year ago, Hektoen and Rappaport<sup>1</sup> published a report on the use of kaolin to remove bacteria from the nose and throat. They found that by insufflating kaolin powder in the nose they were able to remove diphtheria bacilli and also practically all bacteria from the nasal mucous membrane in the course of from three to four days. The swallowing of the powder was followed, likewise, by a rapid disappearance of the diphtheria bacilli from the throat. They found that in scarlet fever the kaolin removed streptococci from the nose very promptly. Their method was to spray the finely powdered kaolin into the nose six or seven times a day at two-hour intervals by the use of a powder-blower, being careful first to have the patient blow the nose to remove any discharge which might block the nasal passages and thus prevent the powder from thoroughly coating the mucous membrane. The insufflation was repeated several times at each treatment.

In order to secure the most thorough application of kaolin to the throat their patients were instructed to swallow very slowly one-third teaspoonful of the powder, four or five times an

hour during the day. In a number of diphtheria carriers, complete and apparently permanent removal of the bacilli was accomplished in this way in from two to four days, and the throat, to a large extent, was freed from all bacteria.

So impressed was I with the results obtained by Hektoen and Rappaport that for the past year I have been using kaolin powder as a routine in the treatment of nose and throat infections. I began by employing it on myself and on members of my family in the treatment of coryza and tonsillitis. I found that it apparently cleared up these infections very promptly, and, moreover, was not irritating, but distinctly soothing in its effects. Similar results were obtained by its use in my private practice.

I made one modification in the method of application of kaolin to the throat. It is rather unpleasant to swallow the dry powder, but I discovered that spraying it upon the mucous membrane of the throat by means of the powder-blower is apparently just as effective as swallowing it.

Although we are still in great ignorance as to the mode of transmission of infantile paralysis, it is pretty well agreed that the most common avenue of infection is through the mucous membrane of the nose. Hence it seems to me logical in combating the disease to use a substance which has been shown to be capable of practically sterilizing the nose and throat and is, moreover, free from any irritating effect. Far from being a chemical poison, it can be swallowed in large amounts without any poisonous effect upon the taker. Its action is peculiar in that it owes "its efficiency in bacterial infections to its action in depriving the bacteria of a suitable culture medium while mechanically burying them alive, separating them from the mucosa and other tissues by a protecting, comparatively impermeable coating."

I should especially urge the use of kaolin as a prophylactic measure in the case of every child or adult who has come in contact with any possible source of infection with infantile paralysis. It has been shown conclusively that healthy persons in whose households the disease occurs are frequently carriers of the infection. Kaolin should also be used by patients suffering from the disease and by those who have recently recovered from it, because swabs taken from the nose have demonstrated the presence of the virus in such persons long after recovery from acute anterior poliomyelitis.

The history of the discovery of the bactericidal action of kaolin or fuller's earth is of interest. Stumpf of Wurzburg noted that human bodies buried in clay did not decompose readily, but seemed embalmed. He began to experiment with the use of *bolus alba*, kaolin, internally and found it of great value in affections of the intestinal tract. In the present European War the Germans have been using it in



cases of cholera, dysentery, and typhoid fever with great success. Stumpf<sup>3</sup> reports that the microscopic findings in the feces of the patients fully warrant its use. Wolff-Eisner<sup>4</sup> states that he believes kaolin a very efficient treatment of cholera. "He regards the kaolin-charcoal treatment as a kind of immunotherapy, basing his belief on Hofmeister's dictum that all the phenomena of immunity are colloid chemical reactions. He believes that the kaolin binds toxins which are beyond the reach of serotherapy."<sup>2</sup> These results suggested to Hektoen and Rappaport the use of kaolin in infections of the nose and throat.

From my own personal experience with kaolin powder in the treatment of infections of the nose and throat during the past year, I suggest its use as a possible method of preventing infection of children and adults with infantile paralysis. It should be insufflated into the nose and throat every two hours during the day. Only by its use in a large number of cases where there has been exposure to possible infection with acute anterior poliomyelitis can it be determined whether it is of value or not.

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## PRE-OPERATIVE ROENTGENOLOGICAL EXAMINATION IN CANCER OF THE BREAST.

By JOHN W. LANE, M.D., F.A.C.S., BOSTON.

UP to the present time no completely satisfactory treatment for cancer of internal organs has been found, the nearest approach to the ideal procedure being the excision or cauterization of the growth in its early stages; and statistics from the leading surgical clinics of the world are beginning now to show encouraging results from the employment of early radical surgical measures. It is the purpose of this paper to assist in preventing the valuable radical operation for cancer of the breast from coming into disrepute with the laity.

Every radical operation for cancer of the breast followed by an early recurrence causes not only the patient to lose hope, but also forces a circle of the patient's friends to become distinct and forceful opponents of the surgical treatment of cancer. When a death ensues shortly after a radical removal of the breast for cancer, another and more vigorous body of laymen become antagonists of surgery. The general practitioner of medicine, to whom these

cases are first entrusted, also comes into his meed of distrust for surgery when he sees his patient return from the surgical clinic without a cure, after having been subjected to a frightfully mutilating and depressing surgical operation. Such results of surgery prevent patients with early favorable lesions from seeking the surgical treatment which today offers so much. Early recurrences and early post-operative deaths are due, not to the operation *per se*, but to the performance of this efficient operation upon badly selected and already hopeless cases.

Before approaching the actual methods of procedure, which the title of this paper suggests, it is well to recall a little of the pathology of carcinoma and consider briefly its method of metastasis. The dissemination of cancer occurs in several ways,—through the lymph and blood vessels, and by fascial permeation. Cancer cells ulcerate into the lymphatic stream and blood vessels, especially the veins, and are thus distributed to various parts of the body. The permeation theory is expounded by Handley and is based on the observation of many post-mortem cases, and at present is strongly accepted. This theory propounds in the main that cancer of the breast extends by columns of cells along the deep fascia, attacking first, naturally, organs or structures in the immediate neighborhood of the growth. Thus, in cancer of the breast, the pleura, the liver and the long bones, at sites where the deep fascia is inserted in them, are early affected. It is very rare to see cancer of the bones of the forearm or leg, because the patient is usually dead before such condition could exist, but organs and skeletal structures remote from cancer of the breast are often attacked by its dissemination; and once a cancer of the breast has metastasized to other organs, operation is useless. It is necessary, therefore, to operate before these metastases take place, and no operation should be undertaken until this dissemination has been ruled out, and it seems to me that the best method of determination of the existence of a metastasis is by roentgenological examination.

In the past year it has been my custom to subject every case of cancer or suspected cancer of the breast to a very complete roentgenological examination. It has been possible by this means to demonstrate in many cases metastases in the skeletal structure although clinically there was no evidence of their existence. We have demonstrated metastases in the mediastinum, in the femur, pelvis, spine and humerus; but not as yet, to our complete satisfaction, have we been able to demonstrate a pleural dissemination. Of course these cases were prevented from going to the operating table, and thus were not subjected to needless surgery. In two of the cases death has already ensued, and in two others, at this writing, is imminent.

I now wish to advocate as a routine, pre-



operative procedure, the examination, roentgenologically, of the chest, pelvis, spine, humeri and femora in all cases of suspected cancer of the breast. It may be objected that this method is expensive. That is true; but expense matters little when useless surgery is prevented. It may also be urged that a radical operation relieves suffering and prolongs life even in advanced cases; but actually how much longer is life preserved and how much suffering is saved than would be the case under skillful medical treatment? As far as I am aware, this is an original method,—as I have not seen any advocacy of it in the literature,—and is presented with the hope that it will help to safeguard the radical operation for carcinoma of the breast, which is fast coming into ill-repute with the people.

### Clinical Department.

#### AURICULAR STANDSTILL: AN UNUSUAL EFFECT OF DIGITALIS ON THE HEART, WITH ESPECIAL REFERENCE TO THE ELECTROCARDIOGRAM.

By PAUL D. WHITE, M.D., BOSTON.

[From the Medical Service of the Massachusetts General Hospital, Boston.]

DIGITALIS may affect the human heart and electrocardiogram in a variety of ways. A total bradycardia may occur in which the pacemaker in the sinoauricular node is depressed and slowed. Heart-block may be produced, varying from delayed A-V conduction to complete block, the grade depending on the amount of digitalis given and on the condition of the A-V conduction system. Ventricular escape may occur, due to a decrease of sinoauricular rate below the rate of the atrioventricular nodal pacemaker or to an increase of the lower nodal rate over that of the upper node. Aberrant ventricular complexes in the electrocardiogram may follow digitalis administration. In cases of auricular fibrillation large amounts of digitalis may produce a bigeminy due to the occurrence of ectopic ventricular contractions at every second beat. The shape of the *T* wave of the electrocardiogram is definitely altered by digitalis; if, for example, the *T* is upright in Lead II, it becomes depressed and finally inverted as the result of the administration of digitalis.

There is one further effect which may occur in diseased hearts after digitalis, which has not hitherto been described as such, so far as I am aware. That is the removal by digitalis of all evidence of auricular activity from electrocardiogram and from the jugular pulse tracing. There is no evidence that the auricle is contract-

ing at all. Against the possibility of an isoelectric *P* in Lead II is the absence of *P* in Leads I and III also, and the absence of *a* in the jugular pulse. Auricular fibrillation may be excluded by the entire absence of fibrillation oscillations of the galvanometric string and the perfectly regular ventricular rate. The atrioventricular node is probably giving rise to the ventricular complexes, because their shape is that of the normal complexes of supraventricular origin and they occur regularly. No deflections appear suggesting that the atrioventricular node is also giving rise to auricular activity. In other words, there appears to be *auricular standstill*. This condition has been produced experimentally in the cat<sup>2</sup> by depression of the sinoauricular node by cold and depression of the junction of auricle and atrioventricular node by asphyxia.

Three cases have been found at the Massachusetts General Hospital in which this digitalis effect has been seen. All three showed definite evidence of auricular action in electrocardiogram and jugular pulse tracings after the effects of the digitalis intoxication had worn off; in all three the A-V conduction time showed some delay during the recovery from the digitalis. In none of the three, at the time of the disappearance of auricular activity, was there any evidence of auricular fibrillation, ventricular escape or complete atrioventricular rhythm.

Lewis<sup>3</sup> has reported one case of unusual bradycardia in which there was no trace of auricular activity in electrocardiogram or jugular tracing. No note was made as to digitalis administration in this case.

Electrocardiograms from the three cases seen at the Massachusetts General Hospital, without evidence of auricular activity, are shown in Figs. 1, 3 and 4. A short account of these cases follows:

CASE 1. Man of 80 years, with arteriosclerosis and myocardial weakness. In June, 1914, a polygram showed a long *a-c* interval in the jugular pulse. On March 11, 1915, after about 2.5 grams of digitalis in the course of three weeks, electrocardiograms showed no *P* wave but did show a definite digitalis effect on the *T* wave, consisting of inversion of this deflection (Fig. 1a). Diastole was smooth, without evidence of auricular fibrillation. The ventricles were beating regularly. Fig. 2a shows a polygram taken this same day, also without evidence of auricular action. At other times this patient has shown ventricular escape with simultaneous auricular and ventricular contractions; when auricle and ventricle beat simultaneously, very large waves occur in the jugular pulse, representing *a* and *c* joined *a* together. (Fig. 2c.) Digitalis was stopped, and on March 21, 1915, a polygram showed normal rhythm with a long *a-c* interval, and a pulse rate of 40 (Fig. 2b.) An electrocardiogram of April 9, 1915, shows the normal rhythm with the *P* wave present in every lead, and the *T* wave returned to normal (Fig. 1b).

CASE 2. Man of 69 years, with arteriosclerosis and



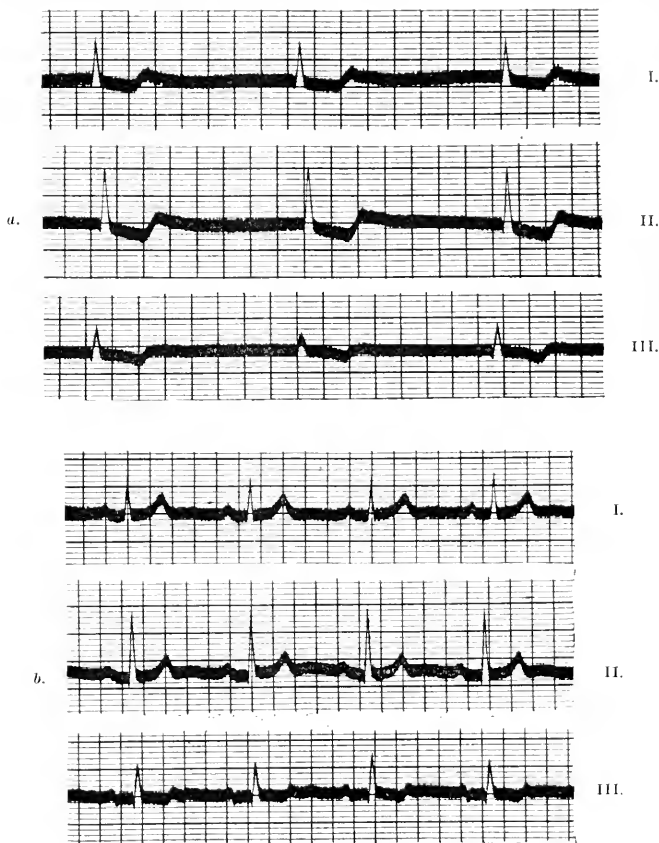


FIG. 1.

In Figs. 1, 3 and 4 abscissa = 0.2 second; ordinate = 10-4 volt.

- a. The three electrocardiographic leads of G. H. A. showing digitalis effects—absence of auricular deflections and invert *T*. Rate = 39. March 11, 1915.
- b. The three leads of G. H. A. showing normal rhythm with *P* present in every lead. *P-R* interval is slightly prolonged. Rate = 55. April 9, 1915.

cardiac weakness. On Nov. 28, 1914, an electrocardiogram showed normal rhythm and defective conduction in the right bundle branch. After 1.7 grams of digitalis an electrocardiogram, taken Dec. 15, 1914, showed absence of auricular activity (Fig. 3a). Atropin sulphate, gr. 1/50 subcutaneously, failed to change the electrocardiogram except for slight increase in rate. Digitalis was stopped and on Dec. 29 an electrocardiogram showed normal rhythm with *P* wave present.

CASE 3. Man of 37 years, with atrioventricular rhythm following auricular flutter, and already described in detail in a previous paper.<sup>3</sup> On two occasions, a month or more apart, the auricular deflections were made to disappear from all three leads of the electrocardiogram by courses of digitalis (2.0

grams in a week), as shown in one instance in Fig. 4a (Feb. 23, 1915). There was no evidence of fibrillation. He had shown a characteristic fibrillation record on a previous occasion during the transition from auricular flutter to the atrioventricular rhythm. On still a third occasion, after digitalis, a large number of the ventricular complexes were unattended by auricular deflections; those that were accompanied by them showed a marked delay in backward conduction across the auriculo-nodal junction (long *R-P* interval). In this case the sino-auricular node was not functioning and digitalis apparently blocked off the auricle from the atrioventricular pacemaker. An electrocardiogram, showing the return of the auricular deflections in the atrioventricular rhythm, is given in Fig. 4b.



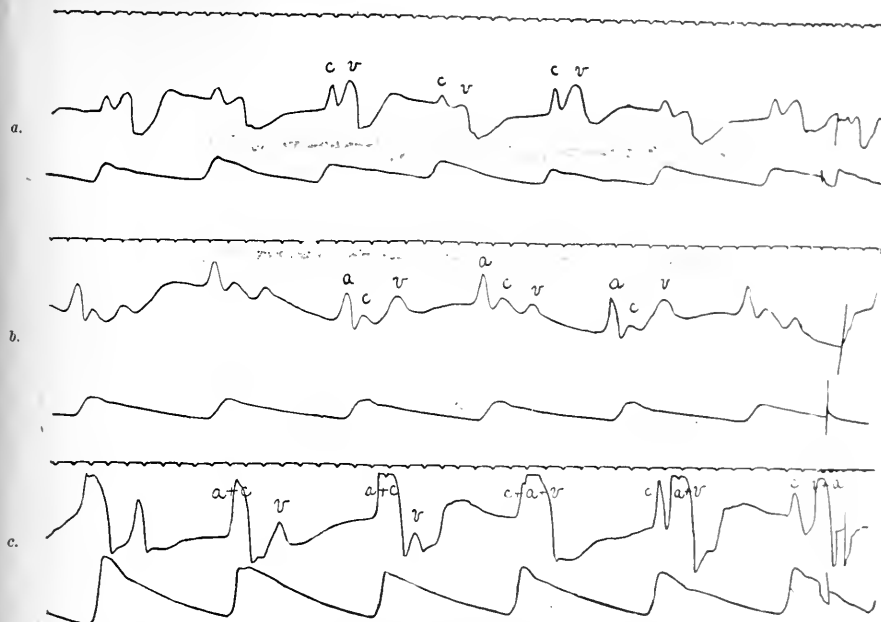


FIG. 2.—Polygrams of G. H. A.

- a. Taken March 11, 1915, showing no *a* wave in the jugular pulse. Time interval = 0.2 second.  
 b. Taken March 21, 1915, showing *a* waves occurring regularly with slightly prolonged *a-c* intervals.  
 c. Taken March 23, 1915, showing ventricular escape. The *a* falls sometimes with the *c* wave and sometimes with the *v* wave. Confirmed by electrocardiogram.

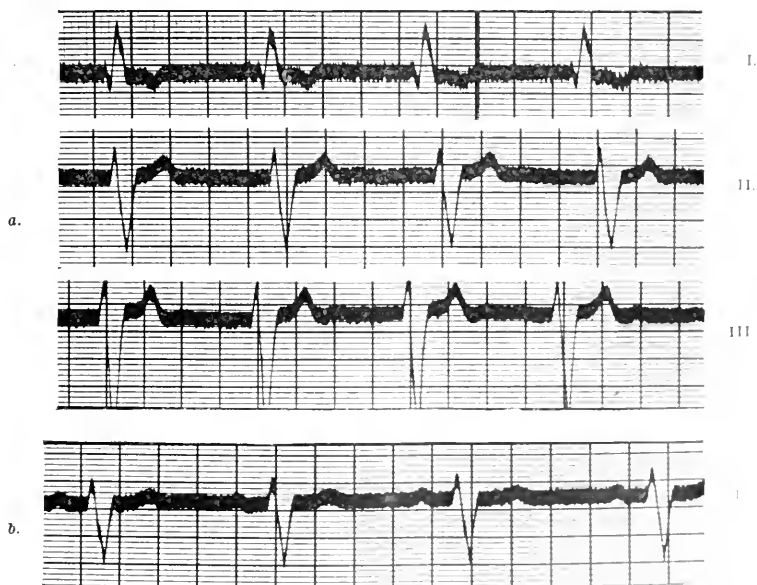


FIG. 3.

- a. The three electrocardiographic leads of W. J. B. Dec. 15, 1914, with no evidence of *P* waves.  
 b. Lead II of electrocardiogram of W. J. B. Dec. 29, 1914, showing *P* waves. (Revised.)



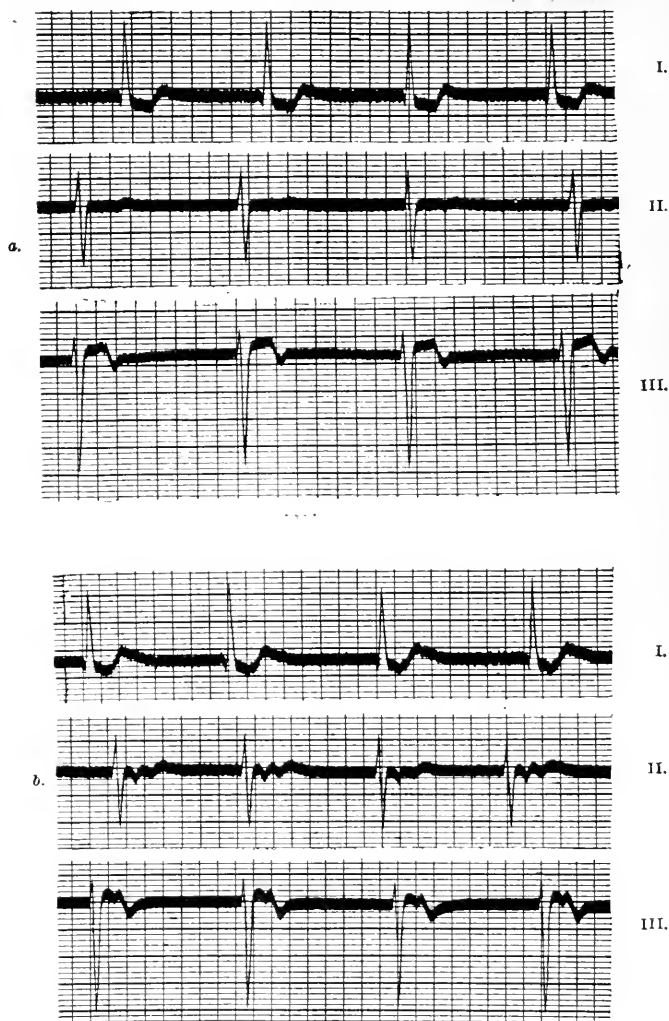


FIG. 4.

- a. The three electrocardiographic leads of W. S., showing no P wave, Feb. 23, 1915. Rate = 37.  
 b. Electrocardiogram of W. S., showing atrioventricular rhythm with inverted P following the ventricular complex. Rate = 42.

## SUMMARY.

Three cases of heart disease are described in which electrocardiographic evidence of auricular activity was abolished by digitalis. As soon as the effects of the digitalis had worn off, the auricular deflections reappeared. This is a rare result of digitalis administration.

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## Society Reports.

### NEW ENGLAND PEDIATRIC SOCIETY.

MEETING of February 4, 1916, was held at the Boston Medical Library. The President, Dr. A. C. Eastman of Springfield, Mass., was in the chair.

The following papers were read:—

1. Fractures of the Elbow in Children\* (lantern slides). W. E. Ladd, M. D., Boston.
2. Physical Types—Dietary Control and Preventive Medicine. John Bryant, M.D., Boston.
3. D'Espine's Sign in Children. John Lovett Morse, M.D., Boston.

#### DISCUSSION.

DR. GREGG (Dr. Bryant's paper): There are few types of disease that we come in contact with in which inheritance plays a greater part than it does in mental and nervous diseases. When we talk of mental and nervous diseases we are on pretty thin ice regarding making any distinction between the two classes. We often speak of some patients as being only "nervous," and where the line is to be drawn between nervous and mental is a very difficult problem.

Analysis of cases has shown that neurotic individuals may bear children who develop manic-depressive insanity; individuals of a manic-depressive type may bear children who develop dementia precox, and dementia precox cases may bear feeble-minded children. In other words, individuals of one type of disease tend to beget offspring afflicted with a more serious type of disease. How much diet and gastro-intestinal abnormalities are to be considered as etiological factors in these different conditions I do not know. But if there is anything along the line of rectifying diet, or improving gastro-intestinal abnormalities which can be done to lessen the incidence of psychoneurotic or more serious mental conditions, we certainly ought to investigate the matter.

I tried some time ago to follow up Dr. Bryant's idea to see if there is anything in the theory that general paresis were individuals of a particular type infected with syphilis, while those who develop skin and visceral syphilis were of another type. The statistics did not come out in the analysis with great clarity, but what conclusion could be drawn suggested that you need a special type of individual in order to get general paralysis from spirochete infection.

DR. MORSE (Dr. Bryant's paper—first question): Dr. Bryant has referred to exercises which favor the development of the herbivorous type in children. I should like to know what exercises he would recommend to make the large intestine grow?

DR. BRYANT (replying to Dr. Morse): "Type" includes not only the intestine, but body form. There is no exercise that I know of that will directly change the length of the intestines, except perhaps the exercise they get in propelling bulky food, but there are exercises which will change the body form, and this is one step in the desired direction. You can enlarge the upper abdomen or lower thorax very easily, and then have present one characteristic found in the wide type, and that certainly is one factor in allowing room for the growth

of all organs. One reason for the contracted thorax in the thin type is that there is, so to speak, nothing in their upper abdomen, and there is no reason why there should be a large thorax, if on account of poses the abdominal contents are largely in the lower belly.

DR. BRYANT (answering Dr. Talbot): There is no hard and fast method of differentiating between cause and effect in this study of type, but I think type is a factor which, if used with other things, throws some light on this question. In answer to Dr. Talbot, I would suggest that improper diet, by which I mean feeding the carnivore large quantities of starch, does, of course, easily produce distention. These people have apparently a thin intestinal wall with limited musculature, and I suppose it may be for this reason that an equal amount of starch produces less distention in the more strongly built or herbivorous person. The distention of the abdomen in childhood is probably due largely to gas formation, acting upon a congenital condition, whereas in later life the pendulous abdomen of the heavy person is almost certainly acquired, and due chiefly to overeating and relaxation of the belly wall. But considering only the congenital type, you will find as many of them with poses as you do in late life. There is a very small increase. I have not looked up my records on them for two or three years, but I think there are over 60% of demonstrable poses at birth, and about 75% in the adult. I think, however, that Dr. Talbot's question concerns both ends of the proposition,—the original form you start with, and an improper diet acting upon the weak intestine apart from any possible influence of such an actual disease as rickets.

DR. HILL (Dr. Bryant's paper): I should like to ask Dr. Bryant if there is any real evidence to show that the carnivorous type actually does eat too much protein food, and if the food supply has been investigated in these types?

DR. BRYANT (after Dr. Hill's question): A great deal of work has been done on the relation of meat diet to body type and intestinal conditions, and there is no doubt that in the carnivores among whom predominate pathologic kinks, excessive putrefaction easily occurs. Patients and others of this thin type have volunteered the information that in order to get any work out of themselves they have to eat meat. I have in mind at present a newspaper reporter who told me that although it did not matter much through the work what he ate, if he had any special important assignment, he had to have at least a pound or one and one-half pounds of beefsteak to "work on." Of course this is a casual remark and is not scientific, as nine people out of ten like meat when they can get it, but I think if you inquire among extremely thin people you will find that many more than half of them prefer a high meat diet because they cannot eat other foods with comfort or satisfaction. Many have fat and starch indigestion, and it is a very simple matter in these people to cut out the bulk of the starchy foods and increase their comfort accordingly by rearranging their diet.

DR. MORSE (Dr. Bryant's paper): Dr. Morse's second question: Suppose you have a child definitely of the carnivorous type. As I understand it, you think that the carnivorous type would thrive better on a carnivorous food. Now, also, you think it better for a people to be of the herbivorous rather than of the carnivorous type. Therefore, would

\* See J. PRINCE, page 220.



you feed such a child largely on a meat diet to favor its own digestion, or on the other sort of food to change its type?

DR. BRYANT (in closing, in answer to Dr. Morse's query about feeding the different type children): You have some ten or twelve years in which to study the child, so it is not a very difficult or acute problem. In many intestines of these carnivores angulations occur which favor putrefaction. There is one thing I might suggest in relation to Dr. Morse's remarks and that is, that although you might wish to feed an individual meat from your judgment of his type, if he has a sufficient amount of kinks, he will be unable to eat his meat continuously on account of recurrent putrefaction. I have found that many of these thin people who want meat and look as if they ought to thrive on it, can perhaps eat it for a day or two at a time without showing toxic effects. Then give them vegetables over a period sufficient to allow the intestine to get cleared out, and they can go back to their meat again, and thrive on this alternating diet. On the other hand, assuming a normal intestine, one may try to increase the amount of fibrous material in the diet to the limit of toleration for a year, or more, perhaps two years, thus forcing the intestine slowly to handle a more and more herbivorous diet. It certainly will be difficult, because most of these children do not like that kind of food. I think these are the children who are incessantly asking for meat. This certainly is not the question in a younger child, in whom adaptation to diet should be more simple. The apparent inconsistency inferred by Dr. Morse's question is easily explained. It is not desired to lose the good qualities of the carnivore, but merely to prevent his too extreme development, which does tend to make him undesirable. It is, after all, a question of common sense and long persistence with a definite object in view. My protest is really against the present method of letting the child choose its own food without thought of discipline or of the future, and of course the poor follow, when possible, the example of the rich in the matter of meat and eggs for the child.

DR. SMITH (Dr. Morse's paper): I should like to ask Dr. Morse whether he considers a positive D'Espiné's sign below the seventh cervical vertebra, if it is the only abnormal sign present, if that alone is considered sufficient evidence of enlarged bronchial glands, or whether there must be with it some other evidence?

DR. MORSE (replying to Dr. Smith's question): I would consider that that was sufficient evidence to show that there was some tissue between the trachea and bronchi and vertebral column which ought not to be there. In all probability that tissue would be enlargement of the bronchial glands.

#### SPINAL INFANTILE PARALYSIS.

DR. CHARLES K. MILLS. Experience with spinal infantile paralysis points to the fact that the disease is infectious or microbic in origin and tends to spread by at least two methods: through certain occult atmospheric or climatic influences, and by contagion. The healthy children of a family should be removed to other neighborhoods, while the sick are quarantined. Through the work of Flexner and others we know the measures which should be taken to prevent the spread of the disease by the secretions of the naso-pharynx and the intestinal excretions. Good nursing plays a large rôle in the treatment of infantile paralysis in all periods of the disease. Rest of body and mind is in the highest degree important. The virtue of a quiet and composed manner should be remembered by the nurse and enforced by the physician. Light and sound should be excluded during the acute febrile stage; also insect life. The method of handling the patient counts for much, especially in cases in which meningeal irritation or inflammation is prominent. The closest attention should be paid to keeping clean the nose and throat by gentle spraying with solutions of hydrogen peroxide or other germicidal solutions. Attention should also be paid to the intestinal excretions. With the appearance of paralysis and contractures, the limbs should be kept in positions less liable to lead to subsequent deformities. Massage should not be used until the fever has largely disappeared; at first, simply as gentle stroking, and later, moderate kneading combined with the stroking. The patient should not be lifted out of the bed, its position being changed in the bed instead. A typical case of the disease is easy of recognition within three or four days after the onset of fever. It should be suspected before the paresis or paralysis appears. The presence or absence of pain and hyperaesthesia may be of value in determining whether the lesion is closely limited to the spinal cord or higher regions of the neuraxis or whether meningeal implications are shown. The physician should not make the mistake of supposing he is dealing with simple meningitis or neuritis when the fundamental disorder is poliomyelitis. When poliomyelitis is rife in more or less distant communities, one of the most essential things to remember is the frequent existence of abortive and aberrant cases so atypical as to make their nature doubtful. Such cases are as much a source of danger to others as those in which the disease is full-fledged in its manifestations. As a neurologist my attention has been called in a striking manner to mistakes of diagnosis in severe cases of poliomyelitis, especially those showing bulbar, cerebellar or cerebral lesions. I have seen in consultation cases in which the diagnosis of brain tumor or meningitis has been made. I would emphasize, therefore, that during the prevalence of poliomyelitis, patients presenting cerebral, bulbar or cerebello-bulbar symptoms should be closely scrutinized with the idea that they may be cases of poliomyelitis of unusual localization. Unless the physician is aware that in the aberrant types the disease may attack practically any part of the brain or cord, he is likely to be misled in diagnosis. Instead of the physician being misled by abortive cases of mild type, exactly the opposite may occur and he may be confronted with febrile symptoms of the most severe character. In three such cases the condition was taken to be

#### SYMPOSIUM ON POLIOMYELITIS.

A JOINT MEETING under the auspices of the Department of Public Health and Charities of Philadelphia, the Philadelphia County Medical Society, and the Philadelphia Pediatric Society, to discuss anterior poliomyelitis, was held on Thursday, July 13, 1916, at 8.30 p.m., at the College of Physicians of Philadelphia. DR. JOHN D. McLEAN, President, Philadelphia County Medical Society, presiding.



cerebro-spinal meningitis, tumor or abscess; in two instances, typhoid fever of the cerebral type. Bearing in mind, therefore, the abortive form on the one hand and that of overwhelming severity on the other, the physician will be on guard concerning diagnosis, prognosis and treatment. The disease prevails epidemically in June, July, August and September. Whenever possible, children of an infected community, who presumably have not been infected, should be removed to locations supposedly immune; and, children should not at once be mixed with others who have been brought from a region where the disease had not existed. The manifest precaution is, whenever possible, to take great care in isolating children from a locality in which the disease is epidemic until the period of incubation is over, that is, after two or three weeks have elapsed.

#### ANTERIOR POLIOMYELITIS.

DR. JAMES H. MCKEE: As Dr. Mills has said, Philadelphia has splendid traditions in the treatment of epidemics. There is little that is characteristic about the onset of poliomyelitis; so very many of the symptoms simulate those of other infections and of some autointoxications. There is nothing very typical about sudden onset with moderate fever usually lasting for several days; nor is there anything very characteristic about the constitutional symptoms, or the fact that the attacks sometimes follow infectious disease. This is particularly true of the polio-encephalitis types. Yet we doubt not that the nervous symptomatology is suggestive in the presence of epidemics. It is not usual for babies and very young children to have severe pains in legs, arms, fingers and toes; headache and backache. This is also true of the tenderness which is often quite general and the rigidity of the neck. There are relatively few things in early life that cause such symptoms and signs. I need not say that we should seek light from the laboratory, where the results of blood and spinal fluid examinations are of undisputed value. One other symptom that is uncommon in infancy and early childhood and which so often leads to the diagnosis of "rheumatism" is that of profuse sweating. In the differential diagnosis we must consider scurvy, but that is a chronic affection with slow onset and definite history and is usually afebrile. Tonsillitis in early life may be accompanied by severe pains. In the various conditions to be considered differentially the laboratory comes to our aid. The appearance of the paralysis marks the place at which most of us should leave off with the patient and be prepared to accept a subsidiary rôle, leaving the major part of the treatment to the orthopedists who know much more about this stage than do we. In the prevention of the disease we must deal with prophylaxis in general. Since the disease occurs particularly during the hot months of the year, we should get the children out of the large cities. The patient should be segregated and much attention paid to the care of all discharges. Animals, although not infected, may be carriers, and should be excluded from the patient. Attendants should wear uniforms and probably rubber gloves. Cleansing of the nasopharynx is essential. The bowels should be opened freely; perhaps nothing is better than the old-time calomel followed by castor oil or salines or hot baths of mustard with as little disturbance of the patient as possible. Sweating is probably one of Nature's efforts to eliminate the

toxins and we have felt that this should be increased as much as might be. In the presence of meningitis lumbar puncture seems wise to reduce pressure and lessen toxicity. Great emphasis should be laid upon the necessity of absolute rest and quiet for the patient. Protection of the paralyzed parts with cotton, wire frames, etc., needs only to be mentioned. Voluntary activity should be resumed very slowly. Hope for the recovery of the paralyzed part should obtain not only for a year, but for many years.

#### POLIOMYELITIS.

DR. PAUL A. LEWIS: Six years ago in this building, before the College of Physicians of Philadelphia, I gave a summary of what up to that time had been done in the study of poliomyelitis. This summary was given from the results in the laboratory of the work of Dr. Flexner and myself. Two years ago Dr. Flexner made a statement of what he had done with other associates in the mean time. Since then little progress has been made. I can in no way disagree with anything that has been mentioned by Dr. Mills or Dr. McKee. They covered the ground accurately so far as their statements went. Perhaps you have seen the article by Dr. Flexner in the *Public Ledger* of last Sunday in which he summarizes his experiences in the matter. While there are some little corrections or notes to be made to that publication, yet so far as the laboratory work goes, it contains the latest evidence. I shall try to recall briefly my own experience with the work and emphasize some points of our laboratory findings in this and in other infectious diseases with which a community may have to deal from time to time. Poliomyelitis, as all know, is understood to be an infectious disease and, in some greater or less degree, a contagious disease. Its cause is known; to the elect few who have had opportunity to work with the disease in the laboratory its cause may be said to be well known. Reports in current newspapers of the very recent discovery of the cause of poliomyelitis are, of course, out of date. The essential cause was discovered six years ago and became a matter of common knowledge to those who read the results of work in laboratories. Three years ago, with the actual cultivation of the organism by Flexner and Noguchi, the causal organism became more perfectly known. Six years ago inoculations were made from the spinal cord of the human dead of the disease into the monkey's brain and the disease was reproduced in characteristic fashion. From the infected monkey the disease was transferred through others to many hundred, and up to the present time the series has possibly reached hundreds of actual passages. It was found very shortly afterward that the infectious material from the central nervous system of the human could be passed through filter-sufficiently small to remove the bacteria and that there would still be a fluid highly infectious. This established the fact that the micro-organisms were of well known bacteriological status, small enough to be passed through filters and difficult to see under the microscope. Some such may be bacterial in nature and can be cultivated as other bacteria are, and others are probably protozoa, such as the virus of yellow fever and transmissible only through an intermediate host. The virus of poliomyelitis seems to be of the former class. It has been said that the organism is ultramicroscopic. It can be seen, however. The organism is so small that we cannot, however, tell anything about its structure, as is now



sible with the tubercle bacillus for example. We know the cause of poliomyelitis chiefly through Flexner and his co-workers, but their experiments have been confirmed and extended by others. Much has been said about the methods of transmission. I believe the studies have indicated to a certainty that transmission is by contact. On the other hand, there may be other methods of transmission. There are certain bizarre facts in connection with the disease not easily explained on the basis of direct contact. However, we cannot go astray in taking this assumption of contact as the starting-point of combating any epidemic that may arise. There is often difficulty in guarding against contact because many cases are abortive to the extent that the individual shows no signs which lead the family to call the physician and no sign which would lead the physician to be positive in his opinion whether the patient had been suffering from any infection, to say nothing about poliomyelitis. For a certain number of paralytic cases there are a number not paralytic, and these are just as dangerous to the uninfected, as are the paralytic cases. Upon these practical matters I feel the fullest assurance that your Board of Health is fully equipped and has a spirit entirely adequate to deal with the matter when the time comes. Such a time in this city we hope may be far from us. We must recognize that the time may come when it will be necessary to exercise the utmost patience with what the health department may deem essential in the effort to combat such an epidemic. By the examination of the spinal fluid tuberculosis and meningitis can be excluded if the tubercle bacillus is found. The study of the epidemiology of the disease under certain conditions the laboratory can greatly help. The laboratory, however, has done its best work in showing that individuals in contact with the infected are frequently carriers of the disease. The laboratory has confirmed the clinical observation that there is a mild abortive or subparalytic form of the disease. Furthermore, the presence of the virus in the nasal secretions has been demonstrated. There is no doubt that healthy adults may carry the virus if they are in contact with the infected individual. I want to emphasize the fact that we are on the right track so far as the laboratory can show in any prophylactic measures which the department of health may think necessary, based upon the supposition of the contagiousness of the disease. The laboratory has produced nothing of practical importance in the therapeutic control of the disease, beyond the fact that certain experiments by Flexner and his co-workers show that the serum of immunized animals and some chemicals could under certain conditions mitigate the disease in monkeys. On the other hand, the fact that these workers have not shared their work with the public is sufficient evidence that they have not a cure for poliomyelitis. Anything the newspapers may say to the contrary should not excite anybody. In considering our ability as a city to cope with this disease we find that we have a good health department and a well educated medical public. That which we have not got, but which could be used to great advantage, is an available sum of money to be devoted to the study of infectious diseases.

#### INFANTILE PARALYSIS.

DR. J. TORRANCE RUGH: The treatment of the ravages of infantile paralysis devolves ultimately

upon the orthopedic surgeon. There are, however, many things which the general practitioner should know regarding the care of these patients during and following the attack. The great essential in the after-treatment of these cases is absolute rest. You will be importuned by the family to allow the patient to sit up, or to move the affected leg or arm. Don't let it be moved; keep that part still, at absolute rest! The treatment as advocated by Oppenheim and elaborated by Lange of fixation in plaster of Paris to secure rest, essential for restoration of function and the carrying away of the products of the inflammation, has given by far the best results in these cases. The great trouble, however, is the difficulty in securing the cooperation of the family in allowing such fixation. Any treatment, so far as our experience goes, which is directed to the nerve centers themselves, has met with utter failure. Certain electro-theraputists claim ability to restore to a very much greater degree the nerve function of these nerve centers than can be accomplished by any other means. But here enters the great problem to which Dr. Mills has already called attention,—that in all grades of infection from the abortive to the fulminating, no man living knows how far recovery of paralysis will take place without any aid whatsoever. Some of these cases which have been totally paralyzed, recover with apparently no evidence of the disease. Therefore, to ascribe to any one method of treatment curative effects so far as the nerve centers are concerned, is entirely out of the question. Our efforts must be directed chiefly to the care of the paralyzed parts. There is a too great tendency to begin the use of massage and electricity too early. These muscles must be put at complete rest until all evidence of the acute condition has subsided. Then the tonic treatment by massage, electricity, or whatever means, are employed, should be begun in the endeavor to maintain the tone of the muscles and the life of the muscle fibers. The muscles are kept at rest to guard against any strain which tends to increase degeneration of the fibers. There must be also the prevention of faulty postures. As a result of the acute inflammation in the structures faulty postures begin extremely early, even before they show themselves to the eye or the finger of the examining surgeon. If the paralysis affects the trunk muscles, the child should not be allowed to sit up. If the paralysis affects the legs, the patient should not be allowed to walk, as there is nothing to maintain the weight of the body except the ligaments and they are insufficient, unless supported by the muscles. Therefore, when the muscles are paralyzed the earliest thing to do is to keep the parts absolutely at rest; keep them from assuming a deformed position and guard them against strain. When the child begins to walk the extremities should be maintained in their proper position. It is surprising, in many instances, the great amount of power which will return after four or five years when these muscles which have been subjected to constant strain have been protected and the part maintained in proper position. If there is any tendency to deviation from the normal position a brace should be applied to the part. The indications for the application of braces are definite, whatever condition may be present and no brace should be applied, except to accomplish certain absolute needs. The therapeutics of a brace are as accurate as those of a drug. Another measure of value to be employed early is that of having the patient practise voluntary movement of those muscles which have



not been totally paralyzed. By giving the child voluntary control over a group of weakened muscles the opposing muscles will be prevented from drawing the part into a deformed position, and when the child walks he will be able to maintain the correct position. In those cases in which there is total loss of power, operation offers a great deal in treatment. This, however, brings in a portion of the work which belongs to the specialist, and any man who attempts work of this kind, unless he is trained to it, will meet with absolute defeat in the treatment of these cases. The surgical treatment of infantile paralysis is divided into the two great classes of destructive and constructive surgery. Constructive surgery is indicated after two years have elapsed since the attack of the paralysis, and consists chiefly in the transposition of tendons, silk inserts and similar measures. Destructive surgery, which aims at securing stability at the expense of certain structures or functions, should not be employed until six years have passed, and in the selection of operations those which utilize structures already existing are to be preferred to those which make use of foreign substances for various purposes.

DR. WILMER KRUSEN, Director of Public Health and Charities, Philadelphia: Of the two cases of reported infantile paralysis now in the Municipal Hospital, one is a case of true infantile paralysis; the other, a case of infantile paralysis, but not of the poliomyelitic type. We have found that the child's paralysis is due to a cerebral abscess following middle ear disease. We have, therefore, only one case of true infantile paralysis. You can readily understand that with such a severe epidemic in New York and Brooklyn, our work in connection with the department of health has been most aggressive. While we believe in preparation for a possible epidemic, we do not believe it wise to frighten either the public or the profession. We have wards available in the Municipal Hospital to take care of at least 100 cases. If necessary, it will be possible to have other general hospitals set aside certain space. I want to take this opportunity to thank the pediatricists, neurologists and orthopedists and all others who have given of their time and service in the last few weeks in assistance to the Department of Health. We have been trying to educate the family to send for the physician promptly when illness occurs among the children. We shall pursue in poliomyelitis the same stringent measures observed in cases of smallpox.

DR. JOHN F. SINCLAIR, President, Philadelphia Pediatric Society: I am glad that for the present the misfortune of an epidemic of infantile paralysis has not come to us. It seems imperative, however, that we should be alive to the questions connected with this disease and be prepared to meet it if we must. Personally, I want to thank those who have been so ready to coöperate, the many who have shown their interest in the subject by the large attendance at this meeting, the College of Physicians for giving us the use of this room, as well as the essayists of the evening.

DR. D. BRADEN KYLE laid emphasis upon the responsibility of the upper respiratory tract for the infection and spoke upon prophylaxis and treatment from this standpoint.

DR. CHARLES K. MILLS: We are not yet aware of the manner in which poliomyelitis is transferred from one geographical locality to another; we see it appearing in widely different sections with great

intermediary regions free of the disease. In the migration of the contagion I think not enough attention has been paid to the part played by animals and to the birds of the air. The possibilities in this connection offer fascinating subjects for study.

## Book Reviews.

*Treatment of Infantile Paralysis.* By ROBERT W. LOVETT, M.D., Boston. Philadelphia, P. Blakiston's Son and Company, 1916.

There could hardly be a more opportune time for the appearance of this work by one of the leaders of American orthopedics than the present juncture, when anterior poliomyelitis is acutely epidemic in New York City and elsewhere in the United States. The great prevalence of the disease in this country since 1907 has led to its more intensive study here than in Europe, and it is to American internists, orthopedists, and laboratory workers that we are indebted for the greater part of our knowledge of its pathology and treatment. Naturally, Dr. Lovett is chiefly concerned with the treatment of the convalescent and chronic phases of the disease, and his chapters on these subjects represent the ripened surgical experience, based on the unusually extensive opportunity of observation which he has had. The earlier chapters, however, on the pathology, symptoms, types, epidemiology, diagnosis, and prognosis of poliomyelitis, and of the treatment of its acute phase, are likewise of extreme value and summarize in classic form the best of our present knowledge. The chapter on muscle training describes a series of valuable exercises designed for the reëducation of infantile paralytics, in which the author acknowledges the valuable contribution of his assistant, Miss Wilhelmine G. Wright. The closing chapter describes the employment of the spring balance muscle test devised by Dr. E. G. Martin, and first applied by him in 1915. Not only at the present time, but in the future, this monograph must be one of extreme interest and value to general practitioners, surgeons and medical students.

*The Medical Clinics of Chicago.* W. B. Saunders Co., Philadelphia, March, 1916.

The March number of the *Medical Clinics* contains a large variety of case reports by seven internists. The cases cover a wide range and there is much incidental valuable information brought out in the discussion. In this number is introduced an account of the further progress of a case reported in the first number. If this feature is continued and developed so as to give the actual end results of all the cases discussed it will greatly enhance the value of the *Clinics*.



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## PREVENTION AND TREATMENT OF POLIOMYELITIS.

THE epidemics of poliomyelitis of New York City and elsewhere continue apparently unabated. On August 10, the number of cases in New York City reached a total of 5822 with 1298 deaths. In New York State, outside of New York City, the total of cases on this date was 856 with 79 deaths. In Massachusetts the total number of cases since June 1 is 178, with 19 deaths. It is evident that the percentage mortality in this commonwealth has been considerably lower than that in New York.

Naturally, the prevention and the treatment of the disease are topics which receive primary attention. Rigorous quarantine regulations against New York City have been adopted by many of the surrounding states. In a recent weekly report of the U. S. Public Health Service is published the following standard set of reasonable quarantine regulations as drawn up originally by the Vermont State Board of Health and recommended for adoption elsewhere.

"1. No child under the age of 15 years shall reside in this state for a period of more than 24 hours without being reported by an attendant, parent or guardian, to the health officer of the town or city where such child is, provided such child has been in the City of Greater New York, since the 20th of June, 1916.

2. It shall be the duty of every housekeeper, manager or proprietor of every hotel or boarding house where such child is domiciled immediately to report such child, giving the name and age, to the health officer of his city or town.

3. Every such child shall be subjected to quarantine for a period of two weeks from the time such child was last in the City of Greater New York.

4. The Health Officer of every town and city to whom such a child is reported shall immediately serve a written notice upon the head of the family in which such child is. This written notice shall contain a copy of these regulations and an order signed by such health officer requiring such child to remain on the premises in which it is at that time for the specified time of two weeks after last leaving the City of Greater New York.

5. Each health officer to whom such a child is reported shall require of the attendant, parent, or guardian of such child a certificate in writing, duly signed by a legal practitioner of medicine, certifying that the nose and throat of such child has been thoroughly washed with a solution of a teaspoonful of common salt in a pint of water once a day for a period of three consecutive days before the premises are released from quarantine.

6. No child under 15 years of age shall enter any house so quarantined.

7. A placard containing the word 'quarantine' shall be sufficient evidence to all persons that the premises are quarantined for the purpose of these regulations.

Nothing in these regulations shall be construed to prevent other members of a household in which there is a child as above described, who has left the City of New York since June 20th, 1916, from attending to their usual occupations.

The owners, managers, or proprietors of hotels and boarding houses may place no restrictions on attendants or guests in their hotels or boarding houses further than the strict isolation of any children, as above described, from New York City, provided such children are isolated to the satisfaction of the local health officer, and their noses and throats irrigated as specified.

Each health officer will see that a copy of these regulations with which he is furnished is conspicuously displayed in at least three public places in his town or city.

These rules and regulations will remain in force until further notice."



Many medical journals are publishing special poliomyelitis numbers, and a large amount of literary material is thus being produced and accumulated on this subject. Various suggestions have been made with reference to the specific prevention of the disease in individuals. In this connection we would call particular attention to the suggestion made in an article by Dr. Whittemore in another column of this issue of the JOURNAL, and to other suggested preventive measures, described under the Miscellaneous column of our present issue. Naturally, the determination of the value of these suggestions must rest upon repeated and extensive experimental observations of their efficacy. Attention is also called to abstracts of current literature on poliomyelitis, to the Philadelphia Poliomyelitis Symposium, and to a review of Dr. Lovett's recently published monograph on the subject in other columns of this issue of the JOURNAL.

Numerous suggestions have also been made relative to the treatment of the disease. Most noteworthy among these is that of Dr. S. J. Meltzer of the Rockefeller Institute, who urges the use of intraspinal injections of adrenalin; and that of Dr. N. MacL. Whittaker of Brooklyn, who has reported beneficial results from the hypodermic injections of quinine and urea hydrochloride.

The conference of pathologists and internists which was held at the New York Academy of Medicine on August 3 and 4, resulted in the appointment of two subcommittees between which the work to be undertaken will be divided. The first committee, which is to consider all phases of laboratory investigation and to suggest subjects and lines of study in connection with poliomyelitis, consists of Dr. Simon Flexner of the Rockefeller Institute as chairman, and the following members: Professor Ludwig Hektoen, University of Chicago; Professor Hans Zinsser, College of Physicians and Surgeons; Professor R. M. Pearee, University of Pennsylvania; Professor J. W. Jobling, Vanderbilt University; Dr. G. W. McCoy, director of the hygienic laboratory at Washington, and Dr. Theobald Smith, Rockefeller Institute.

The other committee, which will consider practical measures that might apply in the suppression of the epidemic, is made up of Professor Victor C. Vaughan, University of Michigan, chairman; Professor M. J. Rosenau, Harvard; Dr. William H. Park, Department of Health;

Dr. F. W. Peabody, Boston; Dr. John Howland, Johns Hopkins University; Dr. Augustus Wadsworth, director of the State Laboratories, and Professor C. C. Bass, Tulane University.

It was also announced on August 7, by Dr. Haven Emerson, New York Health Commissioner, that a committee of entomologists, connected with the U. S. Public Health Service, has been appointed to undertake an investigation of all forms of insect life to be observed in New York City and vicinity, with a view to determining what species, if any, can or may be carriers of poliomyelitis infection. The likelihood of insect transmission of disease has of late been largely discredited. The work of Rosenau in 1912 remains uncontroverted, however, and the possibility of this mode of infection should still be seriously considered. The etiology is rendered fairly certain by the work of Flexner, and seems without reasonable doubt to be represented by the minute coccus-like organisms which he originally observed and described.

The seriousness of the present epidemics seems rather to increase than diminish. The prevalence of poliomyelitis is by far the most important outstanding medical phenomenon in the United States today. Doubtless the disease will, in time, run its course like all self limited epidemics. Meanwhile everything known to science that can be done to check its extension is being carried out. It is the relative limitation of our knowledge with regard to the disease, and our lack of specific methods of prevention and cure, which lessen our present control of its spread, and make the subjects of prevention and treatment the most important present aspects of the situation.

## TWO PHYSICIANS OF A FORMER GENERATION.

IN the issue of the JOURNAL for April 22, 1915 (Vol. clxxii, p. 603) we commented editorially on the life and on the editorial and medical writings of Dr. William Wallace Morland, an early editor of the JOURNAL, basing our comment on material contributed by a correspondent. This same correspondent has recently sent to the JOURNAL some hitherto unpublished verses addressed by Dr. Morland to his classmate, William Thornton Parker.

Dr. Morland received the degree of A.B. from Dartmouth in 1848, and D. O. in 1851.



classmate, Parker, who was evidently his intimate companion and friend, entered the Harvard Medical School together, and both received from it the degree of M.D. in 1841. Dr. Parker died on March 12, 1855, the year in which Dr. Morland first became associated with the JOURNAL as assistant to the editor, Dr. J. V. C. Smith. Dr. Parker's obituary was published in the issue of the JOURNAL for March 22, 1855 (Vol. lii, p. 144). Though there is no positive evidence on the subject, it seems probable that it was written by Dr. Morland. The following extract affords interesting testimony, not only to Dr. Parker's qualities of character and mind, but to the esteem in which he was held by his lifelong friend:

"By the death of Dr. Parker, both the profession and the community have sustained a real loss. To eminent professional abilities, he added that sound judgment, highly honorable feeling and exceeding kindness of heart, which, united, constitute the truly 'good physician.' From early and most intimate acquaintance with him we feel that we can speak with confidence of his attainments, his exertions for usefulness, his qualities of heart and mind. For many years 'we have been friends together,' and the sadness which the departure of a valued associate brings with it is mingled with an unusual amount of very grateful and pleasant reminiscence. Active and industrious in his habits, Dr. Parker established an extensive practice for himself, in South Boston, immediately after taking his medical degree. There are many in that portion of our city who can testify to his unflinching integrity, his entire devotion to the interests of those entrusted to his medical care, his acute discrimination of disease, and his faithfulness, to the very last of his career, as a practitioner. To this trait, indeed, is much of his ill health, latterly, to be ascribed. Overwork did a vast deal towards developing the slow but sure disease of which he died. Unwilling to yield, he struggled on, visiting his patients continuously, often leaving his bed for several successive nights when ill able so to do. Compelled at last to quit an excellent practice and to resign the home-comforts his industry had gathered, he sought health both in Cuba and by a residence of some months in Europe, but without avail. With a strong will and a large share of the good spirits which once animated him, he toiled almost to the last day of his life, to supply the failure of the means formerly afforded by his professional exertions. Occupation was his life. He never seemed unhappy when employed. Pleasantly retired in a beautiful neighboring town, he wrought with pen and pencil, amid much physical trial, but

surrounded with warm friends and delightful influences. To most of his medical brethren here, his skill as an artist is well known. We do not know, in the ranks of the profession, any one who at all approached him in the art of delineation and design. In pencil drawing he was an adept; in coloring, his hand was unrivalled. We have seen his copies from the most splendid anatomical plates, which we literally prefer to the original. In sketching, as well as in copying, he was peculiarly felicitous. One of the most touching circumstances connected with our remarks upon this accomplishment is the fact that the *last* work done by his hand was executed for the writer of this slight tribute to his worth. These drawings, finished only a few days before his death, have a value that can attach to such works alone. He who would so use the pencil might find in it almost a support. By a medical man, especially in these days of minute investigation, the talent cannot be too highly estimated.

"Constantly occupied through the past winter, and enjoying much of that social comfort which was ever grateful to him, he has at last gently passed from earth, solaced by the consolations and hopes of religion. Violent hemorrhage from the lungs was the final agent in the gradual process of dissolution."

The following lines, to which we have previously alluded, further represent in verse Dr. Morland's feeling for his friend and afford evidence, likewise, of his literary ability in metrical composition:

#### TO MY CLASSMATE

WILLIAM THORNTON PARKER (A.M., M.D.)

July, 1838.

There is a word, alas how often spoken,  
A startling word  
Telling of tender ties that must be broken  
When it is heard:  
Farewell! Oh whether in life's early morn  
Or closing day,  
Some friends asunder by that breath are torn:  
How hard it is to say!  
And why is it so hard?—we surely know  
That here below,  
Life's golden current cannot smoothly flow,  
That thorns will grow  
Upon the rose that woos our eager grasp,  
And chillily grow  
The hands once joined in fervent clasp,  
Oh, this we know!  
I could bid thee farewell—and if again  
We meet,—  
Grant heaven it may not be with stifled pain  
To greet,—  
I wish not that a change should darkly fall  
Upon our youth,  
That cold Deceit with her enshrouding pall  
Bury Love's truth.  
Oh, this can never change the low-breathed tone  
Saying farewell!  
It hath a moving power all its own  
Its tale to tell.  
The tongue may falter, but the speaking eye  
How eloquent!



While freshly glow the tints in memory's sky  
 With future bodings blent.  
 Once more, my friend, farewell!—now all is bright  
 Our path around.  
 May fortune kindly for thee ever light  
 Her torch!—and bound  
 About thy brow be Fame's well-chosen wreath;  
 And when all thickly comes thy laboring breath,  
 And droops thine eye,  
 May Hope with lifted finger point above,  
 And show thy seat amid the throngs that love  
 To die  
 Such death as makes the Christian's cheerful tongue  
 In tones triumphant on the death-air flung,  
 Bid earth farewell!

### MEDICAL NOTES.

**CHEMISTS AND TECHNICAL MEN TO MEET IN NEW YORK.**—Official announcement of the meeting of the American Chemical Society, to be held in New York September 25 to 30, in conjunction with the Second National Exposition of Chemical Industries, was issued to the members by Dr. Charles L. Parsons, secretary, on August 15. Dr. Charles H. Herty, of the University of North Carolina, president of the American Chemical Society, will open the exposition on Monday, September 25, at 2 o'clock in the afternoon, with an address reviewing the history of chemistry and the chemical industries in this country, and outlining developments since the outbreak of war in Europe. The presidents of coöperating societies, such as the American Electrochemical Society, the American Institute of Mining Engineers, and the American Paper and Pulp Association, will follow Dr. Herty with speeches of welcome and reviewing the progress made in the industries represented by them.

The first general session of the American Chemical Society will open at Columbia University on Tuesday morning, September 26, and arrangements are being perfected for a public meeting in the large hall of the College of the City of New York on Tuesday afternoon, when addresses will be made of general public interest pertaining to the interesting developments in the field of applied chemistry during recent years.

The program of the week's meetings will provide for general conferences on subjects in which the chemists of the country are now interested, and it is intended that the lecture hall of the Grand Central Palace and Rumford Hall in the Chemists' Club building will be occupied each afternoon at the same time by one or other of the different divisions of the society for the discussion of such industrial topics as the production of dyestuffs, medicinal chemicals, industrial alcohol, the manufacture of paper pulp and by-products, oils and motor fuels, glassware and porcelain, steel alloy metals, new developments in chemical industries, etc.

On Wednesday and Thursday mornings a general symposium on colloids will be held, theoretical considerations being discussed on the first day and the industrial applications of colloid chemistry on the second day.

The American Electrochemical Society has planned a series of interesting meetings. The electrochemical group will open its meeting later in the week, on Thursday, September 28, with a technical session devoted to a review of American progress in the electrochemical industry. A complimentary smoker will be held on Thursday evening, and on Friday evening there will be a joint banquet at the Waldorf-Astoria of the members of the American Chemical Society, the American Electrochemical Society, and the Technical Association of the Pulp and Paper Industry.

### EUROPEAN WAR NOTES.

**SHIPMENT OF RED CROSS SUPPLIES TO GERMANY.**—It may be recalled that during the past winter, as noted in the JOURNAL at the time, the British Government refused to permit hospital supplies to be sent from the United States to the Central European Powers, on the ground that there was no American Red Cross body in those countries to receive and use them. In reply to this action, former President Taft, chairman of the central committee of the American Red Cross, wrote, on May 8, to the United States Secretary of State, commenting as follows on the British proposition to admit no medical stores into hostile countries except for use by an American medical or hospital unit.

"This exception amounts to no concession, for the reason that, as the British Government was advised in August last, after the first of October, for lack of funds, we were able to maintain no hospital units in any of the belligerent countries. The authorities of the American Red Cross believe that under the Geneva Convention, to which the United States and all the belligerent powers are signatories, the United States has the treaty right to insist that articles serving exclusively to aid the sick and wounded in the form of hospital supplies, shipped by the American Red Cross to the Red Cross of the Central Powers, shall not be declared contraband, but shall be allowed safe conduct to their destination."

Again on June 10, Mr. Taft wrote as follows to the Secretary of State, making as a counter proposal, the suggestion that a commission be appointed to supervise the handling of American Red Cross supplies for the Central Powers.

"Replying to the letter from your Department of June 2d, relative to the question of the shipment of Red Cross supplies to the Central Powers, which was in answer to my letters of May 8th and May 27th, I beg to add the following:



"In a communication, dated March 27th, from the British Foreign Office, which was transmitted by your Department to the American Red Cross, occurred the following paragraph:

"Your Excellency will be aware from my note of the twenty-second instant that His Majesty's Government have felt obliged to withdraw the lists of articles which they previously put forward as coming within the meaning of the provisions of the declarations of London regarding articles serving exclusively to aid the sick and wounded. His Majesty's Government have recognized one general exception to the restrictions imposed on the importation of medical stores into enemy countries, namely, that any supplies sent by the American Red Cross to an American medical or hospital unit in an enemy country will be allowed to pass freely into that country so far as His Majesty's Government are concerned."

"In commenting on this in my letter of May 8th to you I said:

"Through your Department we are now in receipt of a communication from the British Government, announcing that it does not intend to permit any further shipment, unless it is a shipment to our own hospital units, in a territory of the Central Powers. This exception amounts to no concession, for the reason that, as the British Government was advised in August last, after the first of October, for lack of funds, we were able to maintain no hospital units in any of the belligerent countries."

"As a possible solution to the difference which now exists in our view of the obligation of the British Government under the Geneva Convention and its announced policy in limiting the permits for shipments of medical supplies to the Red Cross hospital units in the territory of the Central Powers, I beg to suggest, on behalf of the American Red Cross, that while we have no further funds with which to maintain medical or hospital units in the territory of the Central Powers, we should be able to send over a commission of satisfactory persons to receive our shipments and to superintend their distribution to hospitals and to supervise their use. This commission would be composed of persons for whose good faith the Red Cross would vouch in seeing to it that the supplies were devoted to hospital purposes only and to the relief of the sick and wounded."

"The Red Cross would be glad to submit the names of the persons constituting such commission to His Majesty's Government before appointing them. We have been very hopeful that the British Government would change its view as expressed in the correspondence already referred to, but if it maintains its position, we venture to make this proposal as a counter proposition, with the hope that you will submit it to the British Government on receipt of their

reply to our letter of May 8th, which, as you say in your last communication, you have already forwarded."

The following is the reply to this letter under date of July 12, by Sir Edward Grey, Secretary of State for foreign affairs of Great Britain.

"I have the honor to acknowledge receipt of Your Excellency's note of the twenty-second ultimo regarding the proposal put forward by the American Red Cross with a view to facilitate the shipment of Red Cross supplies from the United States to the Central Powers."

"I have carefully considered this proposal, but I am at a loss to understand the suggestion made by the American Red Cross and quoted in Your Excellency's note that the policy pursued by His Majesty's Government is contrary to the provisions of the Geneva Convention. His Majesty's Government have in fact always taken the most scrupulous care to observe the provisions of this Convention, and they cannot appreciate how the present subject at all falls within its scope. In this connection Your Excellency may be interested to read the annexed statement published in the *New York Times* on the 12th May last, which sets forth the views of the French Government on the claims of the American Red Cross."

"His Majesty's Government have no reason to believe that there is an absolute lack in the territory of the Central Powers of the materials required for Red Cross supplies; they have, on the contrary every reason to suppose the reverse for, to give only one instance, not long ago a medical member of the Austrian general staff, Professor Hoehenegg, wrote to —, stating that there was no shortage and no prospect of shortage in medicines or bandages, nor even in highly special medical remedies, so that Austria was hardly concerned in the success of the protest made by the American Red Cross against the obstacles placed by the Allies in the way of the export of such articles from America. In these circumstances it is evident that if any deficiencies in these supplies exist, as to which there appears to be no evidence, it must be due to the fact that the Central Powers prefer to use the materials for other purposes, and any steps that may be taken to give them further supplies would conduce, not to the increased welfare of the sick and wounded, but merely to set free larger quantities of such materials for belligerent purposes."

"His Majesty's Government do not, therefore, feel able to create such an entirely new precedent as would be constituted by the supervisory commission suggested by the American Red Cross."

As a matter of fact, there is now a Red Cross unit in Germany and it remains to be seen whether, in view of this, Great Britain will now permit the shipment of surgical supplies for its



use. In any event, it is hard to see how, as is hinted in the quotation above, medical and surgical materials could be diverted to belligerent purposes.

Finally, on Aug. 1, the following memorandum, apparently intended to close the incident, was received from Viscount, formerly Sir Edward, Grey:—

"The position of the Allied Governments in regard to the importation of medical supplies into enemy countries is that they cannot be called upon to admit a practice which has been forbidden in the case of every blockade established in the past. They consider, moreover, that the Geneva convention obviously does not apply. These principles having been settled, frequent appeals have been made to the Allied Governments to make some concessions as a matter of grace.

"One suggestion is that a neutral commission should be appointed in Germany to receive imported medical supplies and distribute them to enemy hospital organizations, but this suggestion offers no means of restricting in any way the amount of supplies imported. To meet this objection it has frequently been suggested that the Allied Governments should specify the kinds and amounts of medical supplies, the importation of which into enemy countries they will be prepared to allow. But it is impossible to fix amounts in this way. One cannot ration the whole population of Germany and Austria in drugs and bandages. No ingenuity could estimate what might reasonably be needed by the population; it is equally difficult to lay down the kind of goods which may be allowed.

"His Majesty's Government have given close consideration to the question, and they have found themselves utterly unable to evolve any system by which the general shipments of medical supplies, once permitted, could be kept within the limits at all. Their reasons for not allowing unlimited supplies to go in have been frequently stated, viz: that the material sent in would replace materials existing in enemy countries, which could, and undoubtedly would, then be applied to other, and in many cases belligerent, purposes.

"His Majesty's Government on their part have, therefore, laid down the only workable distinction they could think of, namely, that American Red Cross supplies may be sent to American Red Cross units, wherever they may be. They feel that no juster test could probably be found of the strength of humanitarian claims and the interest taken by the people of the United States in needs of the Central Empires, than the extent to which the people of the United States are prepared to subscribe money or send doctors and nurses for hospital work in Germany and Austria. Wherever the sympathies and energy of Americans are manifested by the presence of the Americans engaged in the

relief of suffering, there American supplies can be freely imported and used. This is a very definite concession and opens a wide door to American philanthropy, and His Majesty's Government cannot understand why, if feeling in the United States is strong on this subject, this door should be allowed to remain closed."

WAR RELIEF FUNDS.—On Aug. 12 the totals of the principal New England relief funds for the European War reached the following amounts:

French Wounded Fund.....	\$110,956.67
Serbian Fund.....	102,348.07
Army Huts Fund.....	74,351.60
German Fund.....	63,339.41
French Orphanage Fund...	59,377.38
Surgical Dressings Fund....	42,996.87
Italian Fund.....	21,640.54
Allies' Tobacco Fund.....	1,610.00

#### MEXICAN NOTES.

RED CROSS NURSING SERVICE.—The following announcement was authorized on Aug. 1, by former President Taft, Chairman of the Central Committee of the American Red Cross:

Under the most efficient management of Miss Jane A. Delano, Chairman of the National Committee on Nursing Service, a corps of over 7000 of the representative graduate trained nurses of the country have been enrolled for Red Cross service. This branch of the work has become so large and important and the burden of it so great that Miss Delano felt it advisable to secure a superintendent for the Nursing Bureau, to be, if possible, one of the ablest training school superintendents. The Executive Committee concurred in Miss Delano's recommendation and we are fortunate to secure for this important office Miss Clara D. Noyes, Superintendent of the Bellevue Training School of New York City, who will take up her duties with the Red Cross on or about October 1.

The appointment of Miss Noyes in no way changes the general policy of the nursing service. Miss Delano maintains her position as Chairman of the National Committee on Nursing Service, and will continue to give her invaluable assistance to the Red Cross. Thanks to her devotion, and that of many of our chief nurses who have given up their vacations to this work, more than 1000 are ready for our base hospital units alone. A large number of smaller groups, consisting of 10 nurses each, and known as "Emergency Detachments of Nurses," are also being organized to meet any possible need of the Army and Navy.

THE RED CROSS AND THE UNITED STATES ARMY.—In the issue of the *Military Surgeon* for May, 1916, is an article by Colonel J. R. Kean on the relation of the Red Cross to the United States Army Medical Corps. It is a well known fact that in the event of war the Army



Medical Corps as at present organized would be entirely inadequate for the care of the wounded except in the first zone, which consists of the first aid stations directly behind the trenches, the field hospitals and the evacuation or clearing hospitals.

"The second zone, of communications and base, employs two kinds of units—field columns, which are transporting agencies; and base hospitals, which receive and give adequate medical and surgical service to the sick and wounded. This service in our country has never been organized until war begins; and the hospital service provided has been, therefore, at the beginning of our wars inevitably deficient, untrained and unsatisfactory, and a vast amount of unnecessary suffering and loss of valuable lives has been the result.

"The third service receives the wounded and sick who are transferred from the base hospitals as they become overcrowded; and also the convalescents who are able to travel but require further medical treatment before their return to the colors. This zone includes the army general hospitals and the great civil hospitals of the country which, under arrangements with the medical department, receive and treat the sick. The French are said to have about 4000 of these hospitals, containing 600,000 beds.

"The medical service of the Army is, therefore, like a bridge of three spans, of which the first span is completed and ready for work, and the third span can be rapidly completed because the framework is already in existence. The middle span of the bridge is, however, lacking; and it is believed that the Red Cross should be the organizing agency which will complete this middle span so that the bridge will be ready for use promptly on the outbreak of war. The Red Cross fulfills this function in the Italian and Japanese services, and, to a great extent, in the German, Austro-Hungarian and other European services. It is evident that by taking up this work of organization the Red Cross will perform a public service of the highest magnitude and importance to the nation and will have in the most effective way conceivable contributed to relieve the suffering of the sick and wounded."

**MEXICAN RELIEF FUNDS.**—On Aug. 12 the totals of the principal Massachusetts relief funds for troops at the Mexican frontier reached the following amounts:

Base Hospital Fund.....	\$80,489.25
Home Relief Fund.....	2,633.00

#### BOSTON AND NEW ENGLAND.

**THE WEEK'S DEATH RATE IN BOSTON.**—During the week ending August 5, 1916, there were 202 deaths reported, with a rate of 13.85 per 1000 population, as compared with 190 and a rate of 13.24 for the corresponding week of last

year. There were 41 deaths under 1 year, as compared with 40 last year, and 46 deaths over 60 years of age, against 43 last year.

During the week the number of cases of principal reportable diseases were: diphtheria, 19; scarlet fever, 11; measles, 55; tuberculosis, 48; whooping cough, 30; typhoid fever, 2.

Included in the above were the following cases of non-residents: diphtheria, 3; tuberculosis, 2; scarlet fever, 4.

Total deaths from these diseases were: diphtheria, 3; measles, 3; pulmonary tuberculosis, 22; whooping cough, 2.

Included in the above were the following deaths of non-residents: diphtheria, 1; tuberculosis, 3.

### Miscellany.

#### FRAUDULENT INFANTILE PARALYSIS "CURES."

OFFICIALS of the Department of Agriculture, charged with the enforcement of the Food and Drugs Act, expect that the outbreak of infantile paralysis will tempt unscrupulous persons to offer for sale so-called "cures" or remedies for this dread malady. They therefore have issued special instructions to the Food and Drugs Inspectors to be particularly alert for interstate shipments or importations of medicines, the makers of which allege that they will cure or alleviate this disease, for which, at the present time, no medicinal cure is known. The officials also warn the public that any preparation put on the market and offered for sale as being effective for the treatment of infantile paralysis should be looked upon with extreme suspicion. Inspectors, accordingly, have been instructed to regard as suspicious, and to collect samples of all medicines in interstate commerce for which such claims are made. Makers of such fraudulent remedies will be vigorously prosecuted whenever the evidence warrants action under the Sherley Amendment to the Food and Drugs Act. So-called remedies for infantile paralysis which are offered for import into the country will be denied entry.

The Food and Drugs officials are particularly watchful in this instance because it has been noted in the past that whenever a serious epidemic exists, unscrupulous dealers prey upon the fear or ignorance of the public by flooding the market with worthless, hastily prepared concoctions, for which they assert curative properties, which have no foundation whatever in fact. In the present instance, inspectors already have discovered shipments of a few such mixtures.

The Department will do everything it can under Federal law to protect that portion of the public which is extremely credulous in times



of panic, and which will grasp at anything which promises protection or relief. The sale of such products at this time, the officials point out, is particularly threatening to the public health because many persons, relying on the false statements of impostors, neglect to secure competent medical advice. As a result, not only is the safety of the patient endangered, but in the absence of proper sanitary precautions, the likelihood of contagion is greatly increased.

It must be understood, however, that the Federal Food and Drugs Act applies only to products which are shipped in interstate commerce, that is, from one State to another, or which are offered for import or export, or which are manufactured or sold within a territory or the District of Columbia. Products which are made and consumed wholly within a single State are subject only to such State laws as may apply and are under the control only of State health officials. The Federal law does not apply, for instance, to patent medicines made within the State of New York and sold in New York City. Persons buying or using a "remedy" made in their own State, therefore, must rely on the protection accorded them by their local health authorities.

### PREVENTION OF POLIOMYELITIS.

THE United States Public Health Service has recently issued the following statement relative to the prevention of infantile paralysis:

"To control the present epidemic of poliomyelitis the chain of infection between persons harboring germs of the disease and the well members of the community should be broken. Infantile paralysis is probably caused by a very minute organism found in the nasal, mouth and bowel discharges of those who have the disease, or who are carriers of the germ without themselves suffering from the ailment. All of the steps in the spread of the infection are not known, but if this germ can be prevented from passing from the infected to the well person, the disease will cease.

"Infantile paralysis is not a disease of recent origin. Sporadic or scattered cases have occurred throughout the country for many years, but it is only during the last decade that the infection has assumed epidemic proportions in the United States. The present epidemic in New York City, on account of its magnitude and virulence, has awakened the residents of many communities to the danger of the importation of the disease into their own midst. This danger is real, but if due precautions are exercised it is believed that the epidemic will subside.

"The actual control of the present epidemic must be left to the City, State and Federal health authorities. These organizations will properly quarantine and care for affected per-

sons, prescribe sanitary measures, and limit as may be necessary the travel of individuals in order to protect neighboring districts from the infection. Individuals and communities, however, can do much toward their own protection.

"Poliomyelitis is probably spread, directly or indirectly, through the medium of infective secretions. Account must, therefore, be taken by communities of every means by which such secretions are disseminated. Promiscuous expectoration should be controlled. The common drinking cup affords a method for the interchange of material of this nature, and should, therefore, be abolished. Rigid cleanliness of glasses and utensils at soda fountains, in saloons and other public places, should be enforced. Flies, roaches and other vermin, by coming in contact with infective secretions, may possibly convey them to our food, and thus directly bring about the development of disease. Therefore eliminate insects. Street and house dust bear a definite relation to the spread of many infections, and it is not unreasonable to presume that they may be a factor in the dissemination of infantile paralysis. Maintain strict cleanliness of streets, yards and alleys in order to prevent the breeding of insects and other vermin. See that all garbage and waste are properly cared for and collected at regular and frequent intervals. Guard all food supplies, especially milk and other perishable products. Digestive troubles of children arising from the ingestion of food of questionable quality may lower resistance. Assemblies of children in infected localities are to be discouraged, if not actually forbidden. While the above measures are in a sense general, and applicable to many epidemic diseases, their importance should not be overlooked:

"Individual preventive measures may be thus summarized:

"Summon a physician at once and immediately notify the health officer of the presence of the disease. If the disease is present in the community, medical aid should be sought whenever a child is sick, no matter how light the illness; many cases of infantile paralysis begin with a slight indisposition. Should the illness prove to be infantile paralysis, isolate the patient, place a competent person in charge, and reduce all communication with the sick-room to a minimum. Hospital care is preferable, not only for the child, but in order better to safeguard against the spread of the disease. The sick-room should be well ventilated and screened. Nasal and mouth secretions should be received in cloths, placed in a paper bag and burned. The clothing of the child, the bed linen, and the excretions should be disinfected in the same manner as for typhoid fever, that is, by boiling, the long continued application of 5% carbolic, or other well-recognized disinfectant. The same is true for dishes and drinking vessels. Nurses should exercise the



same precautions as regards cleanliness of hands in caring for infantile paralysis patients as for those afflicted with other infectious diseases.

"A child may convey the disease to others, even after a lapse of several weeks. For this reason quarantine should be maintained for a considerable period, usually from six to eight weeks, and the above precautions should be adhered to during this time. Disinfection of the room following recovery is advisable."

## Correspondence.

### BRITISH MILITARY ORTHOPEDIC HOSPITALS.

(From Our Special Foreign Correspondent.)

LONDON, ENG., July 15, 1916.

Mr. Editor: We have passed a very interesting day in some of the Orthopedic Centres for the British forces. Thanks to the kindness of Colonel Robert Jones, we were conducted through Hammersmith Military Hospital in the morning. At the outbreak of the war the buildings now occupied by the hospital were poor house and infirmary to the surrounding district, but their equipment and size were such that the group was usually known as the "Paupers' Palace."

Patients are chosen from the various Military Base Hospitals and sent here that they may be attended by orthopedic specialists. A very interesting clinic was held and some excellent results shown, such as the efficacy of various splints to improve deformed limbs. The hospital includes a complete little gymnasium equipped with simple apparatus for the use of the convalescents. Even in some of the wards we found apparatus, such as a ladder for climbing and wheels whose resistance might be measured and controlled. With these machines and many others every opportunity is given the men to strengthen their weakened limbs. There is a large corps of massenese and also a department for exercise by electric stimulation, which was most interesting. We entered a large room equipped with about 12 beds. At each bedside sat a girl whose work it was to stimulate various motor points in the patient's muscles under the direction of the doctor in charge.

The apparatus used was not complicated. It consisted of an inductorium whose secondary coil was short and composed of thick wire. The make and break rhythm was slow. The larger of the two electrodes was led off to some convenient spot, as the back of the patient's neck or posterior aspect of the thigh. The smaller round electrode was held in the operator's left palm so that she could feel the extent of any muscular contraction caused. In her right hand she held a soft iron core which she passed in and out of the coil. The entrance of the core served to increase the current in the secondary circuit sufficiently to cause contraction of a muscle or group of muscles and the strength of stimulus could be graduated by the varying amount of core entering the coil. The doctor in charge believed the good results he was obtaining were due to the fact that he never tired the muscles out, beginning with a very brief exercise which he daily increased, and also to the fact that the rhythm of stimuli used was uniform. He demonstrated how easily he could stimulate the vastus internus which was not brought into play by simple voluntary extension of the knee joint. With the exception of ionization he made no further use

of electric currents. We passed on to see an exhibit of water color paintings. Colonel Jones had chosen, as subjects, various limb deformities resulting from wounds of long standing. The artist was a man of very considerable reputation, who was "doing his bit" in this way. Form and color were accurately reproduced and the collection will undoubtedly be of great value. A record of the most instructive deformities was being kept in plaster as well as on canvas. One room contained a well done set of plaster casts in which the maker took a just pride. Some of the casts had been made before treatment and some afterwards, while the nature of the treatment was indicated in each case so that the demonstration was most instructive.

To supplement the morning spent in Hammersmith Hospital, we paid a visit to Queen Mary's Auxiliary Hospital at Roehampton Lane. It is run by the above auxiliary with the cooperation of the medical departments of the army and navy. The unsatisfactory nature of artificial limbs which were being supplied to maimed soldiers and sailors became apparent early in the war, so that on July 20, 1915, a demonstration of artificial limbs, open to manufacturers of all nationalities was held at Roehampton House. Twenty-four different firms took part in this contest. The Directors-General of the Army and Navy Medical Services and the president of the College of Surgeons, England, with the assistance of British and Irish surgeons, acted as judges. Several American firms made very creditable showings and were given exclusive contracts for the production of artificial limbs used in connection with the work of Roehampton House. This institution undertook all such military work for the Kingdom with the assistance of a smaller hospital at Alder Hey, near Liverpool. In October last, there was a waiting list of 800 cripples. Today there is no waiting list unless it be of those in the 570 beds at Roehampton. They accept only those patients who are ready for artificial limbs, and keep them until a satisfactory degree of efficiency has been obtained with the new member. As an aid in this process and that the men may lose no time, work shops have been established on the hospital grounds. Here daily classes are held in stenography, lathe-work, woodwork, electrical fitting and automobile repair. An employment bureau undertakes to secure work for the outgoing patients, or they may go on learning their newly acquired trade in any of the larger cities of Great Britain free of charge. That is, they may enter one of the polytechnic training schools which have been established at various centres. All of the orderlies and attendants about the hospital are old patients, who constantly demonstrate to the incomers that usefulness has not gone with the loss of arm or leg.

As we entered the assembly room, the daily examination was in progress. A dozen men, wearing artificial arms, were standing in a row and each in turn demonstrated to the surgeons his proficiency with the new member. It was surprising to behold the exactness of their movements. One man, who had lost his arm at the middle of the humerus, used his good hand to close the artificial fingers about a pen and wrote his name quite legibly with the new arm. He then removed the hand at the wrist and replaced it by a fork. This he guided accurately to his mouth. Movement of the arm upward and across the chest caused simultaneous flexion of the elbow joint. Each case was considered in turn, and either passed, or the limb maker was requested to try again. A line of twenty men with artificial legs entered and each marched in turn past the surgeons. As we left the "House" and walked down the drive, the grounds were filled with cripples who hobbled about in their blue flannel suits. All that science could offer was being done for them but they were, at best, a pitiful little army of makeshift men.

Sincerely yours,

W. G. P.



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## Address.

### HYGIENE OF THE MIND.\*

BY BENJAMIN P. CROFT, M.D., GREENFIELD, MASS.

THE other day while sitting at the bedside of a friend who had recently undergone an operation involving the taking of an anesthetic, I was more strongly impressed with the value of mental optimism than ever before. Here was a man well over eighty years of age, sitting in bed, recently undergoing an experience which, at its best, is a shock to one's physical or psychical makeup; and yet when I remarked that he was the best example within my knowledge "that only the good die young," he responded in kind by the retort that, "If they thought they could kill a tough specimen like me, they were very much mistaken"; and in the fifteen or more minutes of our conversation not once did he dwell upon his physical ailments except to answer questions which were the result of my interested inquiries.

This man has been a cheerful, genuine optimist ever since I have known him, and though he was well along in years at the beginning of our acquaintanceship, and I have not seen him subjected to the stresses and strains which are the usual atmosphere of the active practitioner of a profession of today, yet we know, if by no other means than from analogy, that any one who gains his financial and social competence by

catering to the public needs cannot escape such friction.

As I sat there watching the twinkling of his eyes and listening to the freely flowing and interesting ideas, I became unconscious of the wrinkled face and other signs of physical wear and tear incident to the constant use of such a long period of years; and even as we talked, I became envious of the possession of a faculty which I believe is becoming one of the most important acquisitions which we as physicians have to develop.

Now at the outset I doubt not that you would readily grant the truth of the statement that mental optimism is a very essential factor toward the prolongation of life, even though in the same breath you would look askance at any statements which tended to magnify the relative value of mind over matter, and in this I would join with you readily, because we know that in the past two decades this term, "mind over matter," as represented by one of the so-called healing sects, has been brought into such close intimacy with the medical profession that the majority of the latter have looked upon it with about the same aversion as is a red color to a bull; but because of the dislike which this term engenders in our minds, I have wondered many times of late, are we, as practitioners of medicine, not in danger of forgetting the real significance of the influence of our minds upon the successful conduct of our work and the better preservation of our physical bodies and of those who are trusted to our care.

If this subject were properly treated, I feel that it would involve a more or less to the

\* Read at the meeting of the Franklin District Medical Society, Greenfield, Mass., on March 14, 1916.



description of psychology, and this, as you know, I should feel incompetent to undertake; and besides, such a course might easily neutralize and render ineffective the few simple thoughts which I have in mind in connection with the subject elected, in so far as it applies to us as individuals in connection with our work.

Now, as usual, I can't seem to construct even a short paper without having some sort of a skeleton on which to start the foundation and superstructure, so that I find it necessary to outline a few headings under which I may develop my ideas as to what I believe are some essential factors looking toward a successful hygiene of the mental faculties.

Among the many influences which could be discussed, let me dwell for a few moments upon the following:

1. The necessity of a good control of the emotions.
2. The wisdom of periodical diversion from our usual mental occupation.
3. The value of cultivating friendship.

#### THE NECESSITY OF A GOOD CONTROL OF THE EMOTIONS.

It may be like bringing coals to Newcastle to talk to a body of physicians about the effects of the emotions as they affect disease favorably or unfavorably, and I have come to feel that in our constant efforts to cure diseases either by drugs, surgery, or both, that we are prone to forget how important the influence of a proper control of the emotions is.

It would not be very difficult to cite from the records of history the many examples or instances where sudden loss of control of the emotions resulted in exceedingly unfavorable results. Take, for example, the classical one of Vesalius, the famous anatomist, who, while dissecting the body of a woman, discovered that her heart was still feebly beating. He was so overcome by mental distress at this discovery that he suddenly dropped dead. Another classical example is that of Louis of Bourbon, who dropped dead from fright at witnessing the exhumation of his father's bones. Then there is the case of Leibnitz's niece, who, upon finding a large amount of gold under the bed of the famous philosopher after his death, had such a powerful emotion of joy that she fell dead; and this was the fate of Sophocles when he heard that one of his tragedies had been awarded the highest prize. Other cases of sudden death from excess of grief or of joy might be cited, and it is more than probable that you could give personal examples from your own experience which would add to this record.

History teaches also that loss of the emotional control, though it may not result in instant death, yet through the development of disease may have just as disastrous consequences, even though these be more prolonged. There are on record several cases of the onset of diabetes

which unquestionably were developed as the result of strong mental emotions of a depressing nature. Lorand in his book on "Old Age Deferred" cites the cases of two young women who suddenly contracted severe diabetes after a fright, while previously there had been no symptoms of such, and in the third, a case of glycosuria, it was increased very considerably; and he quotes from Professor Naunyn, who states the interesting fact that after the bombardment of Strassburg in the War of 1870 many cases of diabetes developed as a consequence of the fear and anxiety brought about by it. These examples, and many others of a similar nature, tend to support the theory that at least a certain number of cases of diabetes are the result of uncontrolled exercise of the emotions, and I judge from my reading that these untoward results are brought about by the unfavorable action of the sympathetic and vagus nerves in relation to the function of the latter in their control of the secretion and other activities of the so-called ductless glands, of which the thyroid, adrenals and pancreas are examples.

Those of you who are constantly using the blood pressure measuring apparatus have undoubtedly noticed the influence of the emotions in the raising or lowering of the blood pressure at the time of the examination, and I think that it is now definitely established that, by acting on the adrenals, mental emotions produce higher blood pressure, in consequence of the toxic action of the increased adrenal secretion, and thus favor the development of diseases of the heart and circulatory system, especially arteriosclerosis, which are so frequently sure to follow.

Then again there are well-known examples by competent observers where this same unfavorable factor acting upon the thyroid produces an alteration in the gland and the development of what we know as Graves' disease, and if this unfavorable influence is continued indefinitely, then ultimately the activity of the gland becomes changed, due to its exhaustion, and we have the development of the other disease, known as myxedema.

It is also interesting that many observers who have recently been investigating the function of the pituitary body can produce the disease known as acromegaly, and Sajous went so far as to claim that this particular gland was the central organ upon which all severe emotions reacted.

That the action of mental emotion on the sexual glands is possible is shown by the many cases of sudden menstruation after various kinds of mental shocks, and the same influence in the male could be demonstrated by citing authentic cases of impotence from the same causes.

That care, worry, grief and sorrow are able to bleach the hair and produce a characteristic haggard, worn-out appearance is pretty definitely established, and though this hair bleaching may not always occur with suddenness, as



did the classical case of Marie Autoinette of France, yet I doubt not that it occurs in a great many cases in persons less prominent than was this last-named character. I think it is safe to say that premature old age is probably brought about more frequently by the condition under discussion than by any of the other contributory causes.

The influence of the emotions in lowering the physical vitality and thus inviting attacks from disease germs has certainly a great deal of scientific interest, but I think I have cited enough examples at least to interest, if not convince you; but before leaving this phase of the matter I would like to call your attention to a few illustrations which exemplify the favorable influence upon mind and body of an optimistic temperament, and I again quote from Lorand, who cites the case of the celebrated English painter, Mr. Frith, who died quite recently at the age of 92, and who when asked the reason for his vigor and robustness used to answer, "No worries and six cigars a day"; and the same author having found on the island of Capri an old boatswain of 80 years vigorously handling his oars, inquired of him the reason of his robustness and received as his answer, "Always merry." In the first case cited, I should not want to say that the six cigars a day were the essential factor in the longevity. I believe rather that it was the "no worries," but I recognize the contributing value of being able to gratify our little habits which cater to our contentment of mind.

So far, in discussing the importance of controlling the emotions, I may have conveyed the impression that I thought this matter was entirely within the individual's control. I don't believe that I should care to claim this, because I am somewhat of the opinion that it is at least partly a matter of temperament, that it, it appears to be natural, at least more easy, for certain people to be optimistic and have more control of their emotional faculties than others, but as the result of giving this matter more or less consideration in the past year or two, I am beginning to feel that it is possible for people at all ages to begin to acquire the faculty of such control. Nevertheless, like any other habit, if this is a habit, I am sure that the earlier one undertakes its accomplishment, the easier it is going to be later, and the more efficient and effective, and I am not so sure but what Dr. Barker of Baltimore is right when he claims that parents should begin very early in life to teach their children to control their emotions, to tolerate pain and to suppress as much as possible the tendency to that condition which is usually expressed under the term "nervousness"; and I think if these ideas could be carried out in the management of children in their early days, it would be much easier for the parents, and life would seem more stable and worth while to the individual who had been taught the importance of this matter, and I do not believe that the endeavor to create such im-

pressions in the minds of children need necessarily in any way mar their happiness or restrict their free development, or mitigate their childish pleasures.

Now when all the above has been said, we are still confronted with causes which depress the emotional state for which we are in no way to blame or are able to exercise little control. Among these may be mentioned, loss of near relatives by death, disappointments of love, failure to attain our ambitions, whether these be of a social or financial nature; but, fortunately, even here we can obtain some assistance by availing ourselves of that faculty of the mind, viz: forgetfulness, which is undoubtedly just as much a self-defense against diseases of the mind as are the antibodies and other natural physical protectors which tend to guard against the development of physical diseases, and though this faculty of forgetfulness might easily, and frequently is, used to our detriment, yet, when properly handled, it can be utilized as a protection during a period of readjustment. It is fortunate that the average man is so constituted that as time goes on he must naturally lose his sorrow. "Time heals all grief," and here also will power has its effects.

After all, is not this question of control of the emotions practically synonymous with exercising the will power, for, unless we have learned how and when to apply the brakes in the exercise of our emotional faculties, what is there to distinguish us from the lower order of animals except possibly the erect posture of our bodies and the greater craftiness which the human can display in the perverse use of his mental faculties?

#### NEED OF REGULAR SYSTEMATIC MENTAL AND PHYSICAL DIVERSION FROM OUR USUAL OCCUPATION.

The need and beneficial effects to be derived from systematic cessation of our regular occupation and the replacement of the latter by some form of relaxation, both mental and physical, seems to be as old as the history of man, and the antiquity of this record of man playing would seem to bear out the development of the theory that civilization with its manifold duties, its need of sustained mental and physical energy in order to make us capable of maintaining our individual parts in the complex life which the higher forms of civilization demand, was after all, a purely artificial thing, and certainly when one observes and reflects a bit upon the havoc which modern forms of living promote, and actually compel, one can hardly refrain from remarking that some of us at least are paying a very high price for our civilization. But here again we find compensation, for if in the evolution of the human, all his powers of offense and defense have been concentrated in the specialization of his brain, and this very specialization creates the ability to select his environment at will and at the same time to adapt himself as well as for his profit.



An enumeration of these diversions is, of course, not necessary at this time. Fortunately they are almost as manifold as is the number of individuals who need such diversion, and I shall content myself with hinting at a few of the more common and well-known methods by which people in all ages have been able to divert themselves and thus relieve the strain upon their mentality.

Foremost among these, both in importance and in the number of its adherents, is some form of outdoor life, and the increasing number of people who seek some form of outdoor relaxation is a striking commentary upon the artificial character of our usual methods of living. I have heard, for instance, golf called the great life-saver for people of sedentary occupations after they reach middle life, and though the writer is not intimately familiar with the methods of this game, yet he can see that if it is not carried to excess, the necessary amount of exercise in the outdoor air which it demands, taken together with the degree of skill which can be acquired in the practice of the play, and which must act as a mental stimulant if one is successful, will account for the large number of its adherents; and yet even here I suspect one must be on his guard for fear of overdoing the matter, and the recent testimony of the prominent New York business man regarding the detrimental effects of sustained golf-playing by both elderly and old people is suggestive. He says that in the last four years he has lost five friends of fifty or over who have died or were stricken with heart failure or paralysis while playing golf or immediately after it. All of them had taken up the game late in life, and with a view of improving their health, as well as for diversion. Although he cites the names of three well-known men who are over 75 and who seem to play the game with pleasure and profit, yet he concludes that when active elderly business men get ready to let up on their sustained work, they would be wise to let golf severely alone. Of course this is a single testimony and from a layman, and it should have little weight in the absence of scientific data. It is probable, however, that golf for the man long accustomed to a sedentary life of mental activity does make demands upon the heart and other muscles that may be excessive, and might prove dangerous unless he could restrain his activity and enthusiasm within very narrow limits at first.

Another very valuable outdoor diversion is the increasing interest in agriculture commonly known as farming. I use the term "very valuable" advisedly, because one who adopts this as his avocation has not only the pleasure to be derived from the outdoor work, but also that which comes from the knowledge that success brings a constructive contribution to humanity.

When one recalls the back-to-the-farm crusade of the past ten or fifteen years, and places himself in a position to interpret the meaning there-

of and also becomes cognizant of what has been accomplished, both by the example of men of wealth and through the medium of governmental and state education, one would find it difficult to overestimate the importance of this work from both a health and economic standpoint.

It is not surprising that modern agriculture makes a peculiarly enticing call to physicians, for its successful pursuit certainly brings into play a number of lines of thought and action with which we are familiar in our regular work, but it gives its relaxation because they are directed along different channels. The majority of physicians are scientists in greater or less degree, and though we often get far from the science of medicine in the practice of the art, yet many do this from necessity rather than from choice, and I think most of us recall with pleasure our laboratory experience while at college, and we know that every year the so-called science of medicine is increasing to the benefit of humanity. Therefore it is not surprising to find that hundreds of physicians have naturally and intentionally devoted their spare time and financial energy to one or more of the different lines of agriculture.

What more attractive laboratory can be found than a piece of land well suited for tillage, and what more enticing relaxation than to bring to this laboratory one's knowledge of geology, chemistry, biology, meteorology, and physiology; for certainly the agriculture of today is nothing more than a composite of all of these various sciences, and one has to reflect ever so little to realize the great variety of conditions of soil and climate, and the composition and origin of the cultivated soil, as well as the conformation of the surface and the great variety of plant growth which arises under these varying conditions.

One's knowledge of geology will inform him of the origin, formation and conformation of the land; his knowledge of chemistry will aid him in his interpretation of the elements that enter into the composition of soils; his botanical knowledge will be called upon when he comes to study the nature of the plants that make up his crop, and a study of meteorology will certainly assist in explaining the varied conditions of weather, which are such important influences entering into the success or failure of the agriculturist's life. Again, one's knowledge of anatomy and physiology is called into play in the breeding and rearing of livestock, and when one comes to study the low forms of plant life that cause diseases on the crops, a knowledge of biology is essential in our efforts to combat these enemies.

It would be difficult to say which of these various sciences is the most important, but certainly that of chemistry has contributed wonderfully in placing this occupation in the front rank of those different lines of work which contribute toward the support and well-being of



man, and this phase of the subject alone has attractive features enough to absorb one's interest, even though one never made any practical application of its principles; and it is safe to say that no other one thing has done more to change the character and arouse the interest of those who follow this calling, either for a living or for relaxation, than the simplifying and putting into every-day language these chemical investigations and conclusions.

Is it any wonder that farming today is calling for a higher type of workmen than almost any other occupation? It takes a large man to drive himself day in and day out, so to arrange his work that all of his time can be utilized to the very best advantage, and because of the climatic conditions, over which he has little control, he is obliged so to systematize the day's work as to utilize the rainy days to as good advantage as he does those when sunshine is abundant; and remember, because of his greater or less isolation, he is without the stimulation which comes from daily intimate contact with his fellows and which does much to keep us keyed up to the necessary pitch.

#### THE RELAXATION OF LITERATURE.

Of course there are a great many people who for one of many reasons could not be attracted for their relaxation to outdoor pursuits, and besides, in a climate like ours, such a course is impracticable for many months of the year; therefore I would like to take a few moments to outline what the reading of books outside our regular line of work may do for us along the lines of the particular hygiene which we are discussing.

It would take much more courage than I possess, as well as far greater knowledge, to do more than hint at what one might do along these lines, for in many ways there is no field of opportunity which is larger or more enticing, and which has more varied forms of attraction than has that of literature; and I believe if I were to be asked my opinion as to what was the greatest boon that had been conferred upon the human animal, I would say that it was the starting somewhere and somehow in the long-distant past of the power of the human mind to generate ideas, to express these intelligently and to be able to transmit them by the written or printed words for the use or pleasure of humanity, and I believe that these faculties alone would justify our existence.

It would be presumptuous for one of my limited knowledge to lay down any definite rules which it were safe to follow in order that other individuals might obtain mental relaxation, but it will do no harm if I mention a few titles of books which are representative of kinds of thought and action which have conferred pleasure, amusement and some profit.

Take, for example, the product of Shakespeare. Where can you find a person who has

produced a greater variety of material of such absorbing interest and, on the whole, more understandable to physicians, than has this man, whose three hundredth anniversary is being celebrated in all civilized countries this year. Like many other great men, Shakespeare did not attain full recognition during his life, but fortunately for the race, the appreciation of his work has been growing, and in spite of all the controversies which the growth of this recognition has developed, he is today, I believe, recognized as the leader in literature.

It would be interesting to develop the reasons for this high standing, but in view of the fact that so much has been said and written about Shakespeare and his works—more than has been written about most nations—I certainly won't attempt even an outline of it; but of these things I am sure, viz: he was able to take plots which had been used for similar purposes by writers of tragedies and comedies from the earliest recorded time up to those who were contemporaneous with him, and by his master mind, he was able to infuse into them new life, greater interest and permanent vitality because of his genius for true interpretation of human nature; and it is a striking fact that, with all the wealth of his material and great number of the personages which he characterizes, there is very little that is untrue in the representation of the thoughts and actions of individuals, not only of his own time, but also of human nature as we see it and know it today.

Take Hamlet, for instance. I think I have read it at least six times, the last time within a year, and I know I did so with greater understanding and more pleasure than at any previous perusal; and, whereas at first the principal character seemed to be nothing more than the prototype of thousands of individuals whose vacillating nature and indefinite purposes make them easy victims of every outward circumstance, I have since come to appreciate in the career of Hamlet a most interesting study in psychology. Although he and Macbeth depict similar types of monomania, yet to me Hamlet offers far more attractive features because of the likeableness of his personality and the refinements which he expresses until his mentality was undermined by his sudden knowledge of the fearful capabilities of the human animal in the attainment of its personal ambitions.

Again, as a study in the baneful effects to be derived from suggestion, where, for instance, can you find a better example than the effects of a thought as expressed in the Witch's Prophecy to Macbeth, which from that time onward changed the whole course of his career? And whereas, previous to this interview, to all intents and purposes he was one of the sanest of men, as evidenced by his accomplishments, the absorption of the idea thrown out by the witches was unquestionably the entering wedge which ultimately upset his whole mental balance.



Then, again, take the lesson to be derived from even a casual reading of *King Lear*. This picture of filial ingratitude on the part of the daughters, and the ignorance of human nature as exemplified in its ambitions on the part of the father, would seem to have been presented strongly enough to last the human race for centuries; and yet even today hardly a year passes but what our court records show controversies of a similar nature with the selfsame results, which indicate that this lesson which Shakespeare tried to convey has fallen for the most part on stony ground. Elderly people are today giving away their property without suitable safeguards, on the mere promise of an individual, relative or otherwise, to discharge a natural obligation without financial compensation, as long as care may be needed; yet almost invariably their initial enthusiasm is cooled in direct ratio to the amount of money or property which they have been able to get into their hands.

Now some might claim that, if they wanted mental relaxation, they certainly wouldn't go into the study of complex characters as depicted by Shakespeare, and if one feels this way about him, one still has access to his works in the form of his comedies which, for entertainment and pleasure, would be hard to replace; and one can easily forget the ordinary cares and harassments of a daily grind by skimming through either "As You Like It," or "Midsummer Night's Dream."

This subject of comedy, however, suggests the name of the other master who has characterized this phase of human nature, namely, Molière, who has often been called the French Shakespeare of comedy. To those of you who are not familiar with him, I would strongly urge the acquaintanceship to be derived from reading the comparatively recent biography by Brander Matthews, and then I am sure you will want to take up some of his well-known plays, and laugh as have thousands before you at the clean, faithful and humorous satire which he knew so well how to produce. We may think human nature has developed and made wondrous strides in the past century, but I doubt if one can get up from a study of Shakespeare or Molière without realizing that man's ambitions and accomplishments are, in the main, almost essentially the same now as they were in those times.

Although there are thousands of books which have been written for very little else than one's amusement, yet I wonder how many men after forty reread those produced by Mark Twain, which were familiar to them in their early boyhood days; and again, what better test as to how fast you are getting old can you make than by reading, for example, Judge Shute's books on "The Real Diary of a Real Boy," or his humorous characterization in "Farming It," which depicts the facility with which the native

Yankee can take the best from the new comer in exchange for that which has long outlived its usefulness. Another one of a similar nature is Booth Tarkington's "Penrod," who makes it simply impossible to fail to laugh and appreciate the perverse facility with which some boys can get into and keep saturated with trouble; and to those of you who are having difficulty in understanding the antics, idiosyncrasies and psychical perversions of the boy of seventeen, I would recommend the book, "Seventeen," by the same author. A study like this makes one realize what havoc sustained responsibility and anxiety produces in the adult, and renders him often incompetent properly to handle his progeny at this age.

Physicians, above all other workers, cannot escape being occasionally depressed by the results of ignorance and disease as they show themselves in the lower strata of society, and it would be difficult, if not impossible, to blind one's self to the spirit of unrest which is ebbing and flowing constantly around us. And though it may seem far fetched to recommend reading of this type as a means of relaxation, yet among the very large quantity of literature which has accumulated around this subject of social economies, there are a few books which are sane and comparatively free from bias.

It may surprise you to mention Ruskin as a social reformer, because those of us who know him at all associate his name with artistic things; and though much of his life was spent in constructive and analytical criticism of painting and allied subjects, yet his versatility permitted him to take up many apparently unrelated matters. Among these were his very advanced views on vocational training and social economies, and it is interesting to note that a majority of the present ideas which have been incorporated in industrial legislation, had their inception in the brain of this dreamer of over half a century ago. What these ideas were to Ruskin is shown in the effects on his mental and physical makeup, for then, as now, new ideas were combated and put into the melting-pot of adverse criticism before being accepted; but Ruskin's nature and temperament were unfitted for the storm that followed their presentation, and even a casual reader of his letters of this period can see the blighting effect of the opposition which his views engendered.

Like every other thing that Ruskin undertook, he entered into this subject of social betterment with enthusiasm and tremendous energy, but after a few years of practical contact with the people that he was trying to help, his keen mind apparently showed him the utter futility of his maintaining his personal effort, because of the incompatibility of his temperament as compared with that of those he was trying to help. I think this conclusion is a reasonable one after reading some of his letters written at this time, and I ask you to bear with me



while I take the liberty of quoting a portion of one of these letters. He said:

"It is not so much from failure of my interest in this class that I have ceased from personal attendance, but I ascertained beyond question that the faculty, which my own method of teaching chiefly regarded, was necessarily absent in men trained in mechanical toil, that my words and thoughts respecting beautiful things were unintelligible when the eye had been accustomed to the frightfulness of modern city life."

And I also quote the following from an appreciation by one of his ardent admirers, and I doubt not it will be understandable to those of you who, though interested in social betterment and rebelling against the apparent injustice of many of our methods of living, yet realize that it takes one type of mind to initiate theories of reform; it takes a totally different and practical type to take such theories and mold them to existing conditions. The quotation is:

"In his earlier writings and lectures, one can see that he thought that the spirit which loved and admired and welcomed beauty and drank at its springs was there in humanity; but as the years went on, he began to see that it was not so. He saw that all the world over the majority of the human race had no care or love for these things at all. He had believed that all human beings were dull only because they admired or tried to admire the wrong things, and he thought that they had only to be shown the right things to admire and love them; but he found that people were at heart indifferent and worse than indifferent, that the world was full of ugly desires or low delights; that men were selfish and cruel and unjust; that they loved wealth and comfort and display; that many people lived from childhood to age under the shadow of base influences and devastating thoughts; and so he began to see that if they were to admire and love what was pure and noble it was not enough only to point out the work, but that the nature of man must be somehow purged and changed."

Now, lest one should feel that in heartily agreeing with the sentiments just quoted, they felt it would be useless to try to do anything for this class, let me just mention the titles of two books, the authors of which have been living examples of the ability, through personal contact, to infuse into people, in the so-called lower strata of society, ideas which, through practical application, inevitably raised their standards of living and improved their methods of thought. Miss Lillian Wald, in her series of articles which recently passed through the *Atlantic Monthly*, depicting her work in the Henry Street Mission in New York City, and Miss Jane Addams' work entitled "Twenty Years at Hull House," in Chicago, are certainly far more interesting than many novels of today. By their sustained activity, almost superhuman tact and judgment, they have brought into practical application most of the theories and ideas first presented by Ruskin.

#### THE INFLUENCE OF FRIENDSHIP.

One other mental diversion which I would like to mention before leaving this subject is friendship.

Did it ever occur to you what a scarce article true friendship is, and where can you find a body of workers who need friendship more, or as a rule have less of it, than physicians?

One who reads much is struck with the amount and quality of the friendships of such personages as Gray, Charles Lamb, Carlyle, Mrs. Browning, Ruskin, Dickens, Emerson and many others whom you will recall, and this is not surprising, for their time and talent tended to promote and develop this virtue; but why is it in all our work we find so little that is really true and stimulating in the contact with our fellow men?

Someone remarked to me not long ago that the present day was more devoid of true friendship than ever before, which he ascribed to the intensity of our life and the greed for transient things. I had just been reading some of Plutarch's Lives, among them his Julius Caesar, and later had read the biography of several successful physicians of the eighteenth century, and the thing that impressed me most forcibly among the many interesting details was the devious trail of envy, hatred and malice which followed in the wake of their success, and I was pessimistic enough to conclude that human nature was much then as now.

I am not now speaking of the so-called Platonic friendship between men and women. History is full of the failures of this type, and he who plays it does so at his peril, but what I have reference to is the possibilities to be derived from true friendship between man and man. Someone has said that "a faithful friend is the medicine of life, for what cannot be effected by means of a true friend, or what utility or what security does he not afford? What pleasures has friendship, and the mere beholding of him diffuses unspeakable joy, and at the bare memory of him the mind is elevated!"

What would it not be worth to us as physicians to be in contact with fellow workers in whom we had absolute confidence, whose company we sought through those occasional periods of depression which come to all active mental workers, and with whom we could exchange confidences with security, and to whom we could give of our best in return?

Fortunately there are occasional isolated instances in almost every community which show the possibilities in this direction. The writer knows of such between two most successful business men who found time to get in contact frequently, notwithstanding the hurried and incessant calls of a busy life. These men held different views on political and religious matters, but subjects they seldom discussed, but on other topics they exchanged confidences, and assisted each other in their work.



ciation with the other one of the largest elements of his pleasures in life, and this intercourse was maintained with absolutely no lessening of their domestic obligations.

Unfortunately, such an experience is sought for and found by only a very few of us, and if it does occur, it is apt to be late in life.

It is useless to ask why this is so, for life is so complex and the speed of living is so intense that apparently we have little time or inclination for anything but the absolutely necessary things of our existence.

Many of us professional men leave college with a smattering of the so-called essentials of our foundation knowledge which we too often mistake for a superstructure. We enter the struggle for existence often handicapped financially. We are soon struggling for what we think belongs to us, and we fight and are fought. We inevitably tread on our confrère's toes, we hear the plaudits of our patients, and have nightmares engendered by false visions of our competitor. If we are not on guard we become inflated with so-called up-to-dateness of recent medical education, pitting it against the years of solid practical experience which come to the older practitioner, often to our great personal disadvantage and our patient's loss. We acquire the pessimistic habit in our prognoses, due often to lack of preliminary training and temporary loss of our common sense and the sane perspective which only years of actual responsible contact with diseased humanity can give. The readiness with which we are called upon to treat what seem like dangerous conditions, and the ease with which a pneumonic consolidation, for example, clears up under our skillful attention, and the use of a recently exploited drug, rival the tales of miraculous cures of medieval times; or we may witness an operation by a man of experience and skill, and forthwith the siren call of the knife—or is it the jingle of another metal—hypnotizes us before the ability for differential diagnosis can be acquired as the result of study and mature judgment, and we find ourselves in the dangerous whirlpool of surgical practice.

If we are specialists then, for example, every cross-eyed child should first have a tenotomy, every case of difficult nasal respiration or a slight impairment of hearing should have the projecting spurs of the septum, or even most of the latter, removed by a sub-mucous; and, of course, tonsil and adenoid tissue in the place where nature intended it should be is dangerous, regardless of the fact that patients have acute ears without adenoids, and go through life pretty comfortably with most marked nasal deformities; and the just as important fact that a chronic otitis media with thickening goes on its progressive course downward after a free current of air has been allowed to enter the pharynx by surgical procedure.

If we are general surgeons in embryo, then a

pain in the abdomen convicts its owner of concealing something dangerous to life, and we all know what an abscess in the appendix can do, and we also know that it is easier and safer to enter the abdomen of the other fellow than it is to take any chances with nature or expectant treatment.

Now don't mistake me. I am not condemning surgery, its utility or life-saving field. Every procedure in the few that I have mentioned has its legitimate opportunity, and there is just as much danger in cowardice as there is in unnecessary aggression, and the physician of years of experience who is doing what he can to keep abreast of the times is only too willing to admit this fact.

But let us get back to the picture. Now what is nature and environment doing to us as individuals all this time, because inevitably we are being molded, and we cannot escape the unvarying law of progress? Incidentally to the practice of our profession, we may have taken on domestic and other responsibilities; perhaps we express our civic interest by political ambitions, or we would like to piece out our meagre incomes, and we make some financial ventures. Anyhow, we become absorbed in the struggle for existence.

At first, as a result of our college momentum, we keep up the study of our art, and even purchase some current text-books or take one or more medical journals and attend local society meetings, and perhaps the state or national gatherings, but almost imperceptibly inertia creeps over us. The physical drain from long rides and night work brings us to our patients foggy mentally and possibly nervous physically; and as for reading medical or other literature or the writing of history records, why they are physically impossible! Soon all cases seem to look alike, and we often get so that if we recall with certainty the location of a certain medicine in our drug closet or its formula in our mind, for purposes of transferring it to paper as a prescription, we congratulate ourselves. By and by, medical journals accumulate without even the wrappers being removed. We receive notices of regular meetings of the medical societies, but we often fail to attend, or if we do, we are reluctant to contribute. We occasionally read the notice of a musical production, or the title of an enticing play, or the name of an attractive, stimulating speaker, but the vision to attend is only momentary, and we go on our accustomed way.

Then something suddenly happens: perhaps we have a birthday and we realize that we have entered upon our fourth or fifth decade, or we have been wrestling with a serious illness and been obliged to call for help, or, in the course of a day's work a valuable life slips through our hands and we awake to the fact that we have been practicing medicine ten, fifteen, twenty years. If the jolt is severe enough and we have



any latent resistance, we come to, take an inventory of our surroundings, and perhaps are humiliated to find that, instead of doing constructive work in the practice of one of the most beneficial of occupations, we have just been working for a living, but in doing so we have forgotten the value of maintaining an intimacy with our fellow workers, have failed to realize the fickleness of public approval, have allowed the biased opinion of a disgruntled patient to have too great valuation, and thereby caused antagonism in a fellow practitioner. Perhaps in the course of our career we took up an avocation, ostensibly to relieve the mental strain, and we have unconsciously made of it our vocation, to the detriment of our professional practice.

If we have become pessimistic we shall rebel at our condition, we shall blame the fickle public and unscrupulous competition. Perhaps we try to excuse our state on the ground that we settled in a rural community and lack the stimulating influences of contact of many individuals, in fact, we may bring into being dozens of excuses, and utterly fail to grasp the fact that we are what we are very largely through our own lack, and principally through failure to recognize the inevitable fact that permanent, steady, substantial growth comes to the human just as it does to an occupant of the vegetable kingdom: through constant absorption of those elements of growth which are placed about us in such abundance, but which must be separated from chaff and useless material by steady, up-hill, sustained, hard physical and mental labor.

If we are game, and there is still time and ambition, we shall reconstruct our thoughts, avail ourselves of what there is of our mental capital, and place ourselves in a position to receive stimulation by contact with others, and by study to practice medicine for the love of the work. If, on the other hand, our awakening has been only momentary, and we become discouraged by the apparently unequal contest, then we shall settle down and allow the moss to go on with its growth.

Occasionally we see examples in communities which are exceptions to the picture which has just been painted. Men, through force of sustained work, actual mental ability, or through the power which comes from physical traits, forge ahead and become apparently successful, if this success is measured by the large volume of their work and the financial return which this brings to them; but at the risk of being considered utterly pessimistic, I would just like to mention that success, if measured by excessive work, has also its drawbacks, and I believe that these cases more than any other need to exercise the greatest care and supervision of their lives, else they become mere automata and go through the daily grind with such intensity that the practice of medicine or surgery becomes little more than the taking in of its financial remuneration. The community needs these men,

and because of this they should so order their lives that they will be constantly fit to discharge their obligation to their constituents; but how can they do this if practically every minute of their waking hours is taken up with consultation, operations, or the getting about from place to place? Perhaps I am mistaken in my belief that these men, more than any others, need to have regular hours for relaxation, a certain period each day for study that they may become informed as to what the other fellows in their line of work are doing, and the periodical personal observation of other men's work that they may profit as only one can who sees ocular demonstrations.

I have known men of this type practicing in a semi-rural community, who rather boasted of a day's work consisting of from two to four major operations, fifteen house calls, and over twenty office consultations, and I know that they were approximately correct in their figures. It is possible that each case got its full value, and that the physician and surgeon was satisfied with his results, and that such sustained labor is consistent with a well rounded life that meets one's ambitions.

On the other hand, I know of men of the same type who are trying to limit the volume of their work in recognition of the need of some sort of relaxation, but because of the steady habitual grind of years, they do not know how to go at it, and the fear of financial loss incident to new moves is just as real in medicine as it is in commercial life; but while they have been floundering around and just thinking and not acting, the years are going by with express-like rapidity, and many of these men show the effects of age and lack of diversion by a little less clearness in their thinking, a tendency to change an arrived-at conclusion, and a hesitant character in their previous manual dexterity. They begin to give up that elasticity and flexibility of mind which are so essential if one continues progressive, and finally they take on a puttering habit in their work, a characteristic which is usually unconscious to its owner, but all too readily observed by the discerning laity, and puts on the stretch the loyalty of the latter.

In conclusion, I desire to emphasize the point that I recognize, that there are many other ways and means of developing mental optimism and obtaining relaxation of mind and body, but this attempt at an outline has already grown beyond the original intention and, besides, I doubt not I have advanced enough ridiculous ideas to meet the usual fate of one who says unusual things in an unusual place, and you may feel like advising the writer to take his own medicine, in so far as it relates to the control of the emotions.

It may be that the needs suggested are magnified and the pictures described overdrawn but in either case I have had the pleasure of the diversion from consideration of one's usual thoughts and responsibilities in connection with the practice of medicine.



## Original Articles.

### MENTAL PREPAREDNESS.\*

By JAMES J. PUTNAM, M.D., BOSTON.

THE nations of Europe are engaged in an unexampled conflict, for which the name "calamity" seems too trivial, the issues are so momentous and the emotions involved so varied and so intense. We are warned that a similar upheaval may sometime reach our shores and are urged to prepare ourselves to meet new military and civic dangers.

But when one thinks seriously on preparedness in this sense, the problem begins to widen and to become more personal, until the question of the war in Europe—its causes, its emotional history, its probable results, the obligations of America with reference to international affairs—relates itself very naturally to the problem with which these lectures aim to deal: What shall we do to make our children and ourselves mentally more stable?

But no sooner is this question thought upon with care than it is seen to merge itself in the still larger one: To what end should one seek mental stability? Have we the right to wish and work for such benefits as health except as an indication of right thinking and acting in the past, and as a means to better thinking and acting in the future? The power to reason clearly and without undue emotion might indeed be welcomed, very properly, as an inheritance, and as a sign of right living in a physical sense; but when present in its best form it necessarily implies a conscious devotion to suitable aims, and the subordination of narrow and private interests to the interests of the community. The exclusive pursuit of private pleasures becomes intolerable as a principle of conduct and is even recognized as accounting for a large share of the evil in the world, or, more strictly, as indicating that the individuals whom it characterizes are still relatively uncivilized or immature at heart.

I call attention to the following propositions as especially significant in this connection:

1. The obligations above referred to seem at first to have reference to one's duties toward particular persons or groups of persons, or to particular situations or institutions,—the members of one's family, one's friends, one's city, state or country, and so on. But presently it is seen that underlying and including these special obligations, a widening series of ideal obligations may be traced—as, to justice, loyalty, humanity, and disinterested love.

2. Another very important principle is that men who wish to make the best of themselves

should not be content merely to work toward good ideals. They should also learn to see, in detail, what the influences are within themselves that hinder the attainment of the ends they seek. Even the pursuit of ideals of a good sort is very often colored and modified by egoistic tendencies. And although the recognition of the fact that this is so ought not to make men reject altogether, as unworthy, their efforts in good causes, still, a due respect for themselves ought to make them feel obliged to trace out the influence of these subtle enemies.

3. Neither of the above mentioned principles can be made available in practice except at the cost of labor and through the acquirement of skill. It must have been borne in, more and more strongly, upon every thinking man, through observation of the present war, that satisfactory results, in whatever direction they may be sought, are to be brought about only through persistent and coördinated effort, whether it be in the selection of a general policy, the recognition of our obligations as citizens of the world, or the acknowledgment of our more immediate obligations as members of the family, the state, the church, or whatever other social ties each person feels as binding. No one is likely to succeed in making practical the beliefs which he comes to hold without bestowing on the task a large amount of faithful and consistent work.

With reference to the first of the three propositions, it may be admitted that some proof is needed before men can be called upon to agree that they owe these assumed obligations to the community;—or, indeed, that they are under any essential obligation to lead an ethical and moral life at all, or to acknowledge religious ties in the ordinary sense. It is true that the claim for the existence of these bonds is not often called absolutely in question; but some people often think so lightly of them that they fail to gain from them any strong motive for their guidance, while others profess an allegiance which really lacks genuineness, and so place themselves in a false position.

In fact, every man should be thought of as being at once a member and a representative of communities and social groups. No man can stand alone,—not only because he cannot practically exist by himself, and never does exist by himself, but because he is so constituted that, from the very nature of his mind, he cannot be conceived of as isolated and single. If societies did not actually exist they would be ideally constructed. Men do not form societies solely because they are forced to unite for protection or convenience, however this may seem to be the case. The philosophic teaching on this subject is very definite and impressive. It has been made clear that the more fully a person tries

\* Read before the Conference of the Massachusetts Society for Mental Hygiene, Ford Hall, Boston, Nov. 19, 1915.



to give expression to his whole self, the more fully he finds himself living outside of himself.

The principle that no man can express more than a fraction of his meaning if he strives to live for himself alone; that individualism is mischievous if it does not lead to an ever expanding collectivism, personal and ideal; that men are in the world, not for what they can get (for themselves alone) but rather for what they can give:—this principle should be the pillar of cloud by day and the pillar of flame by night to all men seeking to prepare themselves for the battles of life. There are illustrations in plenty to show how frequently it has formed a theme in the writings of men of philosophic insight. The "Seven Sins of Dante" have relation to the attempt on the part of individuals to set up their individual passions and desires in opposition to the best interests of the community, in a narrower or a wider sense. The result always is that the community throws back such a-social or anti-social forms of expression upon the author, and this constitutes his punishment. Even those who seem most inclined to throw off their social ties,—as the misanthropes, the shy, the self-conscious, the self-ostracizing persons, and, strangely enough, persons whose conduct marks them as effectively anti-social—are found, when scrutinized, to be peculiarly dependent, in spirit, on the affection and approval of their fellow men. The tragedy arises from their inability to express or accept this affection in an advantageous form.<sup>1</sup>

It may be true that, in a practical way, we cannot devote ourselves to the welfare of humanity at large. But we can devote ourselves to the more obvious tasks at which I have hinted, in the spirit of a larger humanity. We can endeavor to act as if living in a world in which the influences are recognized as binding which we theoretically admire as best. And we can try to detect in ourselves indications that our efforts are otherwise than genuine and can seek, without undue emotion, to see what private interests we are really serving and what correction needs to be applied. I realize keenly the difficulties in the way of doing this and shall refer presently to their nature. But I am convinced that it is a great deal to see clearly what the path is that one desires to follow; and I have been much impressed to observe how many persons fail to get what I consider a proper background for their conduct.

One hears it said, right and left, that marriages are unhappy. But with whom does the fault lie? With what preparation and realization of its obligations is the marriage state entered on? Surely it is not held sufficiently in view that immense sacrifices must be made not only by the husband for the wife and the wife

for the husband, but in the interests of one's belief in the principle of union here involved.

Then, what preparation of a definite sort is made for citizenship? Here and there, no doubt, a good deal. It is, however, one of the failings of democracy that under this form of government men have not as yet found means to secure a sufficient amount of cooperative devotion on the part of its citizens to make the nation, as a unit, successful in its tasks. We blame certain nations because in their effort to give their own states a successful policy, they fail to recognize their responsibilities toward other nations; fail, in short, to recognize sufficiently the principle of the ideal background of cooperative life to which I have alluded. One might think that the individual citizen could properly be appealed to for support of this principle. The appeal would be in vain, however, unless he had made it a rule of conduct in his own life. Meanwhile, the example set by certain races who have kept alive their national spirit and have spread abroad their national influence, yet have not maintained themselves as a community in a political or military sense, should not be forgotten. Whether the example of these races is to be literally followed, or not, the fact referred to may be taken as a new chance for upholding the declaration that it is not enough for an individual, a specific group of individuals, or a nation to take its own success as a sufficient criterion for the justice of its course. To work for one's nation seems a virtue; but whether or not it is virtue depends on whether the national success is thought of as a final goal. If it is so thought of, then the sacrifices made by the individual to secure it become the expression of a peculiarly subtle and pernicious form of selfishness, a tendency anti-social in spirit though social in form.

Akin, in principle, to this danger is another which is everywhere to be seen. Many people have, namely, a strong feeling that they should only recognize attachments that are personal in character; or, at any rate, they are disinclined to admit that they owe a still greater loyalty to ties which are not personal. The very warmth of these personal attachments induces in such men the belief that it would involve a painful sacrifice of something which they do and should hold very dear if they were asked to recognize that the love for a single person could under any circumstances merge itself in love of the idea for which such a person stands. Yet every one admits that when private and public obligations conflict, the latter must often supersede the former:—

"I could not love, thee dear, so much  
Lest I should love thee less."

And indeed it should be seen that through the very fact of this sacrifice the personal relationship may gain in strength and value, instead of losing.

<sup>1</sup> Rev. Edward Everett Hale's "Man Without a Country" may be remembered in this connection, in which the change of sentiment is pictured in the mind of an exile who believed himself wronged to desert and curse his native land, but found at last that his love of country was his strongest passion.



Although the principle according to which a man stands in intimate and necessary relations to the community, or to the idea which the community represents, seems so obvious that when studied in general terms no one is inclined to contradict it, yet in practice it is constantly contradicted. Some persons are unwilling, others seem unable, to acknowledge their social bonds; and although the contrary motives are usually of a selfish sort, yet, strangely enough, it often happens that the very strength of the inward craving for the affection of one's fellow men leads to an instinctive reaction against its expression. Thence come the habits of shyness and self-consciousness which may cause a person so affected to be accused, and to accuse himself, of offishness and a preference for isolation. The mental tendencies and temperaments of such a person need to be made the subject of close study. The main question is whether the desire to withdraw oneself from society is prompted by the wish to grasp an opportunity to serve society in some better form, or by a secret sense that one's affections are misplaced; or a dread lest they may fail of recognition and so lead to discomfiture.

Then, too, the true functions of what is called "independence" and "individualism" are liable to be misapprehended. The question is, again, whether the kind of independence and individualism that is actually cultivated tends to an intensification of egoistic introversion, or, on the contrary, to a new and better movement of a social sort. These qualities are of real value when they are used in the interests of a higher morality. One must not be either too dependent on the good will or affection of one's neighbors, one's friends, or even of those toward whom one stands in relations of the nearest and most sacred sorts. In fact, it is just here, with reference, for example, to the relationship—oftentimes so tyrannical and stifling—of parents and children, that independence needs preëminently to be preached. One can hardly go too far, however, in acknowledging one's dependence on such principles as those of justice and loyalty and disinterested love, and even—if one does it with open eyes—on the persons whose attitude and affection represent these principles; and the deep and mutual love of the mother for the child, in so far as it leads both to a wider sympathy with their fellow men, is a feeling that is precious. In short, while independence of others is often emphasized as a means of intensifying one's sense of power and gratifying one's egoistic propensities, thus becoming a social influence, there are two reasons of a practical sort which do in a measure justify the striving for the possession of this quality. These are, namely, because independence is useful as a protest against the tyranny of social conventions that have become too narrow, and because it is capable of serving as a protection against personal relationships that

threaten to become too overwhelming or too close.

If, now, it is as evident as I have made it appear that men ought to live so that their lives will be representative of the spirit of the community at its best, why is it that this aim is not more often and more strongly cultivated?

It is certain that men are pulled strongly, and by influences of which they are but imperfectly aware, in various directions adverse to this goal. Numerous attempts have been made, in figurative and literary form, usually in the interest of ethics and morals, to give expression to the influences here at stake. Bunyan's "Pilgrim's Progress" is a typical example of these efforts. It is, however, only within a relatively few years that it has been seen that the attempt to classify, and thus in some degree explain, men's tendencies toward selfish, anti-social conduct must, in order to be successful, be based upon medical psychology. For the difference between sickness and health is a difference of degree alone, and the tendencies which are exhibited in what one calls "diseases" of a certain sort, and can best be studied therein, give inestimably important clues to a knowledge of behavior among persons who count themselves as "well." The "symptoms" of many nervous disorders—those, namely, in which the emotions are primarily involved—are, for some purposes, better definable as "modes of reaction" in the face of situations of difficulty. When looked at from this standpoint they are seen to be the equivalents of kinds of "behavior," such as are usually looked upon as more or less admissible or more or less objectionable,—and, in either case, as compatible with what is commonly defined as "health," although in fact they are not compatible with the best sort of health.

To look upon behavior in this way brings us back to the contention of the earlier pages of this paper, where it was claimed that the value of a man's mental health is to be estimated in part through considering how it is to be employed.

The nobler qualities that the war has brought to light are qualities of a highly social order. The baser qualities are those of undeveloped, relatively immature, a-social, pleasure-seeking, and often cruel beings,—beings capable of generosity and devotion of a certain sort, but not of a sustained disinterestedness of a high order, or of a devotion such as sees in its object (the person or the clan) the embodiment of an idea and an ideal. The consideration of these baser qualities and their history—on some points of which I have already touched—constitutes the study of the second of the three main propositions defined on an earlier page.

The results won by civilization are often far less thorough-going than those observers might suppose who judge the members of society only by their professions and their ordinary behav-



ior. It is easy enough for men to conform to manners and customs of a kind of culture to which their inmost feelings—or, to speak more accurately, a part of these feelings—fail to correspond. Men may easily dress alike, use the same language and forms of speech, join their neighbors in social groups which have a high standing and reputation; and yet they may carry with them—partly or wholly buried in their minds—characteristics that belong to a culture of a far more primitive sort than that which they assume themselves to represent. The two sorts of tendencies thus represented are often so widely different, even so antipodal with reference to one another, that many persons—and indeed, in some measure, all persons—may, in a sense, be said to lead double or multiple existences; and the question is, in accordance with what laws or principles can one best describe the situation that obtains?

The principles that seem to me chiefly significant are the following: In the first place, the human race, as a whole, undoubtedly does move toward a type which we can represent to ourselves ideally, though only ideally. This is the goal of ideal perfection, as above alluded to. The evidence is too strong to be called in question that an influence is actually at work in the world that indicates the existence of such a goal and points the way toward it.

But this influence, although unconquerable and indestructible, exerts but a slight amount of force from moment to moment, and may readily be pushed aside. Every man, and still more every child, is under a constant temptation to take, instinctively, the course that is easiest and most natural, and then to seek to justify himself for doing so. He may, indeed, do this consciously within certain limits; but the unconscious yielding is the more significant than the conscious. Thus, we are led to revert to simpler states, in which less is demanded in the way of self-sacrifice and more is granted in the way of self-indulgence. In short, men tend to maintain within themselves, as affording opportunities for relief from toil and for actual self-indulgence, habits of thought and feeling of objectionable sorts. The child in us lives forever, intermingled with our adult tendencies, and while this is in some respects fortunate (since childhood is in some degree the golden time of life), yet it is also unfortunate. For childhood contains elements such as the self-respecting and self-knowing adult cannot tolerate, unless, indeed, after they have been transmuted and assimilated, so as to form suitable ingredients of a broader and a better life.

How shall men learn to deal to the best advantage with this tendency to reversion, and how shall they best help their children to neutralize the temptation to indulge in it?

It is often felt, and has often been said, that the growing child, the adolescent, and eventu-

ally the adult, must learn to "repress" what are denominated as his "evil passions." To say this is to state what is but a half truth; and furthermore, it is to indicate an educational effort which is in many ways pernicious. Some primitive, elemental tendencies must, it is true, be put down with a strong hand, in so far as there is no better way. But it should never be forgotten that the forces represented in these elemental tendencies—the source of so much over-intense and even fierce craving—cannot be suppressed to the extent of annihilation and should be made use of, so far as practicable, as stepping-stones toward a richer and more spiritual life. Any one who strives to repress these tendencies, without giving them the chance to convert themselves into something better, may merely be shutting up, as if in the box of Pandora, the germs of future mischief.

To some extent, indeed, a relative repression may and must go on, and men's æsthetic future, their poetry and art, will be the richer for it and serve as an outlet which is often entirely legitimate; for we cannot turn all our feelings into knowledge and wisdom of such a sort that they can be expressed in words. But if the elemental passions are too insistent, or if the repression of them is over-done or too high handed, then these stifled tendencies will seek redress, and may obtain it through inducing what may be called "symptoms," or, again, through setting up unfortunate traits of character (more unfortunate, perhaps, in reality than in outward show) which form a sort of compromise between the elemental tendencies of immature type and the strivings inspired by conscience and the pressure of society. Persons so afflicted—and the statement applies in some degree to all men—cannot feel themselves either wholly free, wholly at home with others or themselves, or as if living in a wholly real world.

How shall the education of the child be arranged so that he may avoid, at least, the worst sorts of these mischances? I can indicate only in barest outline a few of the principles at stake.

In the first place, it should be realized that the same forces are immanent and vital in the child that have brought mankind to where it is and that will carry it still farther. Theoretically,—if everything could be arranged as in practice it can never be,—a real opportunity of usefulness and happiness, a real function as member and representative of the community, is conceivably before every child. This principle the parent and the educator should always bear in mind, striving to see, for the still ignorant and mystified child, what the future might have in store for him provided he should show his best power.

Next, the parent and educator should have in mind, when dealing with the child, the long



forgotten history of their own early and earliest childhood,—partly wayward, as it doubtless was, and at all events widely different from what their present outward thoughts, acts, and feelings would suggest. The material for this degree of self-knowledge is, thus far, in the hands of a relatively small number of persons; but it is available to every one who will give sufficient time and labor to the task of seeking it. In the absence of the requisite self-knowledge on the parent's part, the next best course is to abstain, so far as possible, from interference with nature's processes, avoiding the attempt to force the child too hastily into the mould of adult customs, but studying, meantime, his meaning, and giving him a truly humble sympathy.

If, in pursuance of his best destiny, the child could move steadily toward some even fairly adequate goal of social companionship and usefulness, all would go well enough with him. But at each moment, and especially at the various critical moments of his history, he must meet obstacles, to be surmounted perhaps only with effort and assistance. If the obstacle is too great, the tendency will be strong to shirk it; and this tendency, at first negative in appearance, becomes at once more and more strongly positive in proportion as the temptation to follow the broader path of pleasure or indulgence develops its powers of attraction.

Every child is permitted to be an egoist,—partly, perhaps, because it is instinctively felt that in this world of strife a considerable amount of self-assertive tendency counts as an asset of value. But unfortunately, with many persons, to be once an egoist is to be always an egoist; and from childhood on the game may be played—not indeed, with the whole of one's complex personality, but with a part of it—of finding ways to be egoistic and self-centered without seeming to be so.<sup>2</sup> Vanity and egoistic self-indulgence may cloak themselves under the disguises of overdone humility, sorrow, depression, pride, world weariness and endless other forms,—even that of self-destruction, which usually means withdrawal from the world of effort, carried to its final term.

The point of next importance in the child's development is that at which he begins to seek an outlet for his—altogether natural—passion of love, in the form of love for some other person to whom he may attach himself. The dangers here are manifold, and are rendered doubly subtle through the fact that another person's personality is involved. The attitude of the child, under these conditions, is best guessed at by reflection as to the attitude of the parent. Is this always—in the case of the mother, for example—one of disinterestedness alone? Or is it in part her own feelings of self-indulgence that the mother loves to foster in her dealings

with the child? How is it about the only or the preferred child? Truly, the lot of such a child is liable to be a hard one.

Finally, and to conclude, I wish to say a word about the imagination of the child, its legitimate uses and the dangers of its abuse.

His glorious power of imagination is one of the child's best attributes. Through it he can learn to see a world that seems more real than the world of things around him, to live in which seems to live in possession of all that one desires. But those who have seen at close range the results, in later years, of the indulgence, on the child's part, in an unbridled substitution of this imaginative riot for the toilsome world of real life (which greatly needs to be illuminated by imagination of a better sort) will have learned that this tendency has another side. Everything that happens to the child should be a bridge leading to a broader life. If his experiences do not have this end; if his pleasures are taken too much in and for themselves and become sources of self-indulgence; if the child, fascinated by the creations of his fancy, forgets that he must keep himself their master, his pleasures and his fancies are liable to turn upon him to his harm.

Both the prevention and the cure of these evils are best brought about through a thorough-going attempt to find the truth.

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## THE MEANING OF THE MENTAL HYGIENE MOVEMENT.\*

By WILLIAM A. WHITE, M.D.,

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I SEE in the audience a number of gentlemen who are connected with institutions for the insane in Massachusetts, and I believe there are a number of social workers here. I am not going to speak to them, because I believe there are a great many persons who have been attracted to this meeting from advertisements that they have seen or notices in the newspapers. This is a new movement, and I believe that those are the people we want to address; those are the people whose interest we want to stir up in this movement, and so I shall talk to what I believe to be a more or less mixed audience, and I shall try to tell them, in as simple a way as I can, what I conceive to be the meaning of this mental hygiene movement.

Now I have no doubt that perhaps one of the first questions that comes to your mind in connection with the mental hygiene movement is, what relation it has, if any, to insanity? and perhaps, after all, what insanity is? and I will

\* Cf. Meredith's novel, "The Egoist."

\* Read before the Conference of the Massachusetts Society for Mental Hygiene, Ford Hall, Boston, Nov. 17, 1915.



try to answer that question for you to begin with. Insanity is a word that has been used for a great many hundreds of years, and a great many different people have tried to define it, and they have usually failed, but I think I can give you some idea of what the word means and what class of people it refers to.

If you will think of a primitive community out in the Middle West during the times when the Middle West was yet the frontier, you will realize that a member of that relatively primitive community could, if you will think of Mark Twain's descriptions, ride down the centre of the street and yell and holler and shoot, and it was thought to be a comparatively normal kind of conduct and nobody thought it was strange and nobody interfered with it. Now when communities get to be older and more civilized, when they get to be more congested, one can't do anything that he may happen to choose, without crossing the path of someone else. Then certain conventions of conduct have to be followed and there have to be greatly restricted lines of conduct, so that if a man acted as I have described, he knows just where he would land in the city of Boston. It might be and probably would be, in the jail. In other words, he is exhibiting a certain type of conduct which the community—to speak in slang phrase—won't stand for, and they simply remove him from it.

In the group of people that are called insane, are people who exhibit a certain type of conduct which cannot be tolerated in the community in which they happen to live. I remember not long ago, in walking down to my quarters at the hospital, a woman threw up the window, thrust her head out and shouted, "Murder!" Nobody paid any attention whatever to her. We were used to that sort of thing. She shut the window down, and went back to bed. She was in a community where she was understood. But she could not do that sort of thing anywhere outside of an institution without being shut up for insanity. And so it is that any individual must conform to the established forces of the society in which he lives.

Now what is the characteristic of these types of conduct of which I have been speaking? It is social inefficiency. The individual who manifests a kind of conduct that is calculated to tear down the existing conventions, to deviate greatly from the normal conduct of the community,—that person is an individual who has to be relegated to some place other than a position of free citizenship. Thus a certain type of social inefficient conduct may be said to be insane conduct, and so the word insanity comes to be, as I see it, not a medical term at all, but a social term which defines a certain kind of socially inefficient conduct.

Now let me elaborate a little further what I mean by conduct. You or I or anyone else can think all we want to about threatening some-

one's life; we can formulate all sorts of plans about meeting him and shooting him, as long as we don't say anything about it and don't do anything about it. But let us for a moment start to put such a plan into execution, and that moment something will happen to us. In other words, we may have any sort of desire, our thinking apparatus may function in any one of a great number of ways, but so long as it doesn't manifest itself in our outward conduct in any way, society hasn't any interest in it. So then, I would say that insanity is a certain type of socially inefficient conduct, a certain degree of socially inefficient conduct that causes trouble in the community.

Now there are a great many different kinds of socially inefficient conduct. The insane are one type, the feeble-minded are another type, the criminal are another type, the neurotic and nervous patients are another type, and I call your attention to the fact that in the exhibit downstairs, if you will go over the various charts of admissions to different institutions and hospitals over the State of Massachusetts and the penal institutions and asylums, you will see that all these different individuals are characterized as juvenile delinquent, alcoholic, syphilitic, etc.; you will see that all these different varieties of people are recognized in that exhibit as coming within the purview, in one way or another, of the general movement that this meeting represents,—the mental hygiene movement.

Now let me give you some illustrations—the type of socially inefficient conduct of the feeble-minded. The feeble-minded individual is an individual who has not developed to the full mental stature of maturity. We speak of the feeble-minded as having a certain psychological age. We mean by that that they have reached a certain age mentally, irrespective of what their physical age may be, so that a person forty years of age physically—a person who has really lived forty years—may really be only nine years old, so far as his mental development is concerned, and so that person is only a child, and we should call him an imbecile, from the mental standpoint. Now in our society our forty-year nine-year-old has all the rights of society. He can vote, if he is a he,—and in some places if he is a she,—and enjoys all the rights of citizenship. But that type of people often do things which are socially destructive, and they ultimately drift into some of the various institutions caring for their kind, according to the thing that they have done rather than according to the kind of person they are.

Now the paupers also belong very largely to socially inefficient people, speaking of them from the point of view of their social development. That seems at first blush not to be so. Let me give you an extreme instance of what I mean. Suppose a man goes to court and supposes his position happens to be that of a blacksmith and



he can't any longer ply his trade, and he goes to the poorhouse. One naturally supposes that his pauperism is dependent upon the physical injury. But how many people have you known who have lost an arm or leg, or both legs, or perhaps their eyesight, and yet were able to get along and lead efficient lives in the community? Helen Keller comes immediately to my mind,—a young woman now, I think, in the neighborhood of forty years,—who lost her eyesight absolutely and her hearing when she was about three years old, and yet she is not only an efficient member of the community, but is a capable writer and speaker, and very much loved by everybody. I saw her not long ago in Washington. She had been down to see the Adams Memorial. She goes to see things, you know, just like any one else does. She jumped out of the auto, she felt around the base of the statue, and her first remark was, "I have never seen such beautiful azaleas!" And then she felt up further and she remarked instantly upon the trees. She climbed out upon the statue and felt over the face—of that marvelous piece of sculptured work, and in a few minutes she exclaimed, "This should not be here. This ought to be on a battle-field." Perfectly marvelous! And yet she had been blind and deaf from her third year.

Now as to the man who loses his arm. If he goes to the poorhouse, it is because he has not been able, you may say, to make a readjustment; it is because he has lost his nerve; or you may formulate it in any other way you wish. If he had had the mental capacity, he would not have had to go to the poorhouse. So the great number of people who are in our poorhouses are there because of some type or other of mental inefficiency.

The criminal belongs to another type of inefficient individual—a type of inefficient individual positive rather than negative. The so-called insane person usually has not done anything of a positive nature to destroy property or life, but the criminal has done something positive to injure society. Dr. Fernald says at least 25% is a conservative estimate, and I am sure the per cent. is as large as that, or larger—at least 25% would absolutely come within the purview in some degree of feeble-mindedness by our present methods of examination; and when you look at the thing broadly in the way that I am trying to show you now, it is a perfectly proper thing to say that they come within the group of socially inefficient individuals: and socially inefficient must mean some degree of mental defect at its highest level, so that all these groups of socially inefficient individuals belong within the problem of the mental hygiene movement.

What are we going to do with them, and who is to judge? We have two large types of problems to meet, and I am dividing the matter off into two groups. We have two great groups of people, one of which we can say is salvable,—

can be saved,—and the other group cannot be saved. We have another group of people who can be prevented from breaking down in this sort of way, and certain other people who, if they have broken down, can be brought back into a condition of social efficiency—of ability to live in the community; and then we have another very large group who cannot be gotten back into a condition of social efficiency. As to the first group, those who can be saved, those about whom something can be done: to give you an illustration, let us take a child, for instance. Suppose the child is an only child and suppose in addition that he has had some serious illness so that he is more or less crippled. What happens to a child under such circumstances? The parents are extremely solicitous of such a child; they take the greatest care of him, they do everything in the world to protect him, to prevent harsh words from hurting him in any possible way, and so they rear a child who is tender, who is incapable of meeting the ordinary rough problems of life, and who finally when he has his own way to make, finds that he is quite unfitted to do so, and he meets his problems of readjustment with irritability and crossness and attempts to get away from them, and he feels that the world is a pretty tough place to live in and that people are pretty harsh individuals, and that the world is all thumbs down for him.

Now here is a type of case that we see very frequently, a type that seems quite unable to meet the ordinary problems of life in a quiet, effective and efficient way. Now such children as that very often break down, and there the problem of mental hygiene fits right straight into the problem of education. I remember, in a talk that I gave not long ago, I said that we sometimes do a great deal of harm by education. Let us go down into the mining regions of Pennsylvania and here we find a miner who gets three or four dollars a day and lives in a little house and has two or three children. His girl goes away to school and she learns a little algebra, a little French and a little piano-playing, and she has been spoiled for occupying the position into which she was born, while she has not been given the means to rise out of it. Then a good dominie came and took me very much to task for what I had said, and told me that it was right for every miner to have a piano in his household, and that the poor people were entitled to everything that they could get in the way of education. And then I realized that I had not put it quite as clearly as I should, and that I had not said exactly what I had intended to say. If we are going to succeed in our valuation of human individuals, and are going to succeed early enough during the educational period, we have got to learn how to be able to tell what sort of material a person is made of before we crowd them with tasks that they are ill fitted to perform.

Now we know something about the other or-



gans of the body,—bad heart, lungs, etc.,—but we don't know how to value the strength of the mind. We don't know how far we may go in our education in forcing our young people, and we may do them a great deal of damage. But the neurologist and psychologist have asked the question how to determine this very point. We have now what you have heard called vocational psychology, to try to find out what children are fitted for, and educate them along those lines and not try to educate them for what they are not fitted. We cannot solve that problem in a number of cases, but in some the main lines are fairly clear. To the parents of a feeble-minded boy, we may be able to say, "This boy may be taught to run errands and do such simple tasks, but he is only so far developed and he'll never develop any more; that is, his limit is reached, and if you try to push him any further beyond his limit you will soon get into trouble." In the case of normal people the question becomes a more difficult one, and we cannot know how to answer it. But the question has been asked, and the main thing is to ask the question, because as soon as the question has been asked, we can find some way to answer it.

A youngster who has been brought up in a family where the father is a drunkard, and the father comes home at night and raises the old scratch, curses and swears and beats his wife, etc.,—and we all know there are plenty of such cases on record,—never gets the right attitude in the beginning. This youngster, who ought to be raised in a situation where he will look up to his father with respect, look to his father as the source of authority, learns to hate his father for the way in which he acts, beats him and is unreasonable with him, and so such a child grows up into later life and you can see how it comes about that he grows up hating all sources of authority; he hates all forms of restraint, he hates the social institutions which form the controlling situations in which he lives; and such people become the rabid type of anti-social or anarchistic persons—anything you wish to call them—and they shoot and destroy;—they become such individuals. And so mental hygiene is interested in the family situation; it is interested in the social conditions that are brought about and that begin and have their root and source and origin in the childhood of the individual.

Now take the neurotic. A hundred years ago the mother of a household did all the housework, made all the children's clothes, had to weave the cloth that the clothes were made out of, and a hundred other things. Nowadays there isn't a single thing that the mother of those days used to do that can't be done a hundred times cheaper and better, by a corporation around the corner, than she can do it. So to speak, the woman, and the mother of today both, are, to a certain extent, out of a job, and she is looking for some legitimate and adequate outlet for

her energies, and that is one of the reasons for the so-called "woman movement." Mental hygiene is interested in all movements like that because they have their root and make-up, too, in the individuals that go to form society.

Now how about the individuals who can't get hold of themselves; who are so broken and so damaged in one way or other that they can't be sent back into the community as useful and efficient members of that community? We have a duty towards them, and it isn't a simple humanitarian, altruistic duty of love to your brother without any compensation. If it was, I don't believe I should want to talk to you about it, because I don't believe I could impress you with it in a way that would be of any value. I don't believe anybody does anything in this world nowadays without some sort of expected return, and I believe that a great big movement of this sort could not live unless the thing that we were trying to do brought some sort of return to you individually; to you as members of the community; to the community of which you are members, and would return to you in the benefit which all the community derived. Therefore, there are two things that we want to do for these individuals. We want to give them something and we want them to give something back to us, because anything that isn't paid for isn't worth anything. Indiscriminate alms-giving is a vicious principle of humanitarianism and it usually isn't a method of procedure that has back of it any valuable idea. People who give alms to suffering individuals, usually do it to relieve themselves of seeing the suffering rather than to help the individuals. The only way to help people is to do it intelligently, and the real way to help people is to help them to help themselves. So there are two things that we want to do for these unsalvable members of the community. We want in the first place to provide an environment for them in which they can live and find the maximum individual expression that they are capable of.

Now I was talking in Illinois the other day, and Mr. Johnson of the Vineland Institution for the Feeble-Minded was speaking about the feeble-minded problem, and he started off with the general proposition that the danger from the feeble-minded is all a delusion. There isn't any danger from the feeble-minded. The danger is the danger that arises from the unkind and unintelligent things that the people in the community do to the feeble-minded. The feeble-minded person in the community can't get along usually because he isn't let alone. The feeble-minded boy is teased by his companions and bothered and made fun of until he turns around and kills somebody. Then the community says there is a problem. The feeble-minded girl is made use of by some morally unscrupulous individual, and then she brings feeble-minded children into the community. So we'd be all



right if let alone. Mr. Johnson gave instances of this, for example, a feeble-minded girl—a girl in a physician's family—forty years of age. He went to call on the physician and rang the bell. When the maid answered the bell he recognized her as a girl that he had recommended for this position. She had been living in that house, taking care of the children and doing simple tasks, for over twenty years. Living in a place where she was understood, where she was decently treated—100% efficient. If she had been out in society, out in the open, absolutely dependent upon her own resources, among people who did not know or understand anything about feeble-mindedness, her efficiency would have been zero.

There are any quantity of just such feeble-minded people who get along with 100% efficiency, if in the type of environment which our institutions provide. I remember an insane man, for example, who used to go out and dig every day—trenches—a valued worker, working every day. Now digging trenches is worth \$1.50 a day. About once in so often he would stop in the midst of his work, more particularly when he was coming back from work, and jump and stamp and howl and make a tremendous display. He had the idea that the devil was on his back and he was trying to get him off. This thing might happen a hundred times a day, but nobody paid any attention to him. He was crazy, and yet, although he had been so for many years, he was probably 100% efficient, so far as his earning capacity, his capacity to earn an ordinary day's wage, was concerned. Outside of the institution he would have come to grief in fifteen minutes. And so one of the things that society has to do is to provide a proper environment for these people.

A proper environment means a great many things. It means the whole problem of institutional management. A hundred years ago proper environment was locking such a person up in a cell, chaining him to the floor, or beating him to death. But we know now that this is not the best plan, and that it is economically the worst way to deal with these people. You deal with people in that way, and it will cost you twice as much to take care of them, because they are made destructive. We had a woman come to the hospital the other day who came to us with the history of having attempted suicide. She was a criminal from one of the federal prisons. We have not had a minute's trouble with her since she came. They had been watching her every move, repressing her at every turn, but we simply let her alone and gave her freedom to do the thing which she had attempted to do, and which she then no longer had any desire to do.

So, then, the community wants to provide both as a matter of common decency and of economic value, an environment in which these people can find their best personal expression,

and second, it wants to provide an environment where these people can pay back what they are getting from the community; so if we provide an environment, it should be an environment where these people can do something to pay for what the community is giving them. Those are the two general principles with which we have to deal in working with the unsalvable type of mentally defective individuals.

Now the hospital for the insane has a great many functions to perform, one of which is to take care of these unsalvable types, and another is to get well those who can be gotten well; the third is to represent in the community in which it is located the centre of information about all such problems as this, so that the community will feel that it is not an institution absolutely surrounded by walls, but an institution which is willing at all times to reach out in a helpful way in every direction and to all persons in the community in which it is located.

The institution is the natural place and the scientific place where problems in regard to the types of people of whom I have been speaking should be worked out, and they should be worked at until solutions have been reached which are sufficiently valid, sufficiently correct, sufficiently definite and far-reaching to be backed up by the community and formulated in some sort of statute.

The same thing is true of the prison problem. In the prison problem,—and it is largely a mental problem, too,—I think that if we endeavor to correct the mistakes that have been made in shutting up a great many real defectives in prisons, it will help a great deal. In this way we could try to save those who are salvable, and if they are not, prevent them from committing depredations, at least. After these problems have been worked out by the psychologists, then the social workers, and all the different agencies of these various institutions can finish the good work by formulation in the crystallized forms known as statutes, and then they can be generally accepted and then the institutions can carry them out.

I am neither a pessimist nor an optimist; I try to take a middle course. I don't believe that we are ever going to get away from the problem of the mental defective; there is always going to be a problem; but the thing we can do is, perhaps, to make the distance which separates the man at the top of the ladder and the man at the bottom a little bit shorter, but we can shorten that distance only by a concerted, really tremendous effort. But society is advancing. It is going ahead all the time. We have to a certain extent largely solved the general problems of sanitation and hygiene, and we finally come to the disorders of the mind and what to do about them, and that, after all, is the most important of all of them, because upon the conditions of our minds rests whether we are happy or unhappy, whether we are effi-



cient or inefficient, whether we are successful or unsuccessful, and our manner of living is, after all, simply dependent upon our minds.

So then, finally, after all these things are formulated by legislation, we can go on with new problems, always believing that there is something more to be accomplished further along the line. We are never going to be able to solve all the problems, but the most important thing for the individual and for society is to try to solve them. We shall never reach the goal, we sometimes think, but we do it in some cases, and we should not want to do it in all, for the person who has finally accomplished everything to the perfection of his ideals, is usually through with his work and is of no more use in life.

So I want you, if possible, to feel that here is an effort of the very greatest importance that is just beginning now to be born in this present-day society. You have here in Massachusetts one of the best organizations for dealing with the questions of mental disease that there is in the United States. I hope that the citizens will take that individual interest in what that system is trying to do—which is the key-note of success of a democratic form of government; and it is because we want the citizens to take that interest that these meetings are being held, for upon that interest depends the success which any such movement as this can hope to have.



### THE MENACE OF MENTAL DEFICIENCY FROM THE STANDPOINT OF HEREDITY.\*

By HENRY H. GODDARD, PH.D., VINELAND, N. J.,

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You have listened to two most interesting and valuable papers on two aspects of the Hygiene of the Child Mind—how to conserve the good qualities<sup>1</sup> and how, by right treatment, even restore those who have begun to lose their natural vigor.<sup>2</sup>

It is my not altogether pleasant duty to discuss with you a less pleasing because less hopeful side of the question. I am to remind you of that group to whom the laws of mental hygiene have little or no application, because their minds are so weak there is little to conserve, and no cure is known. From the standpoint of the child, something can be done to make them a little happier; from the standpoint of society, no amount of mental hygiene can ever render them efficient citizens. Society can, by proper treatment, render them less of a menace than they are naturally; and the ills that we now suffer on account of them, can be largely reduced.

It is estimated that there are from 300,000 to 400,000 mental defectives in the United States.

That is based upon the United States census of 1890, in which the question was asked "Whether defective in mind, sight, hearing or speech, or whether crippled, maimed or deformed, with name of defect." Now if anyone can estimate what proportion of the true number of the feeble-minded would be returned in answer to that question, he will be able to estimate how near the truth is the 200,000 which the census report gives. Three hundred thousand or 400,000 seems to be a conservative estimate.

I am to discuss this topic from the standpoint of heredity. It has not yet been successfully contradicted that two-thirds of this army of 300,000 or 400,000, owe their condition to heredity. A quarter of a million of these people are feeble-minded because their ancestors were feeble-minded. They have inherited the condition just as you have inherited the color of your eyes, the color of your hair, and the shape of your head. There is a tendency in these days to attribute a great deal to heredity. But of this particular thing there seems to be no question. The menace of the problem comes, not from the fact that a quarter of a million inherited their condition, but because they are transmitting that condition to their offspring. Of that quarter of a million feeble-minded persons in the United States, do you know how many are being cared for, guarded and kept from propagating their kind? About 24,000 out of 250,000 are today being cared for in such institutions as you have here at Waverley. The rest are living—their lives, are raising families, and providing abundant opportunity for the exercise of the charitable impulses of numberless generations to come. And that condition of things is getting worse rather than better.

I shall not take your time—it is not necessary—to speak of the bearing that this has on our social problems. You know of that. You have had it presented in several different ways, and there is no finer work, that I know of, than your own work here in Massachusetts by the "Commission for the Investigation of the So-called White Slave Traffic," in which it was found that over 50% of the women were so absolutely and definitely feeble-minded that they might be admitted to an institution like Waverley at any time.

What shall we do? There have been two answers. Some say, "Segregate, shut them up. Keep the sexes apart." We are told that if we could do this for a generation our problem would be largely solved. The two-thirds in which the condition is largely hereditary would be eliminated. I want to assure you that the problem is larger than that. In the first place, looked at from the practical standpoint, we do not seem to be able to segregate. We are taking care of 24,000, and there are at least 250,000 to be cared for. If the State of New York, for example, for its estimated proportion of mental defectives, it would require thirty institutions of 1,000

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each. They find it hard to raise money for the three or four institutions they now have. Their appropriations are cut every year. In the State of Massachusetts there are at least 14,000 feeble-minded persons. It would require ten institutions the size of Waverley,—a demand upon the public treasury which we are not willing to meet. I have not found anyone yet who is optimistic enough to think that we shall meet the demand within any reasonable length of time,—a time so short that we can safely rely upon that as a solution of the problem.

Another group of people say "sterilize," and there is a percentage of them who say, "Get a sterilization law on the statute books and you are all right." There are a great many people who think that all that is needed is law. There are now twelve states that have sterilization laws, and there is not one that is making any great use of it. Wisconsin has operated upon a few feeble-minded. The State of Indiana did something in the case of criminals, but at the present time there is nothing being done along that line. The laws cannot very well be made practicable except for those who are in institutions. There is no other solution suggested for these people in the way of care.

If asked what we shall do,—which of these, or what else,—I should say, "Both; and everything else that we can do." In other words, it is a problem that requires our most careful thought and requires the application of every means that we can conceive of. I believe that sterilization might be a great help in a great many individual cases—solving individual problems, relieving a situation where we cannot see any other way to get at it, and I think it will have to come, and have a very much larger application than the laws now provide for. Somehow we shall have to come to the point of authorizing a commission of physicians to carry out this practice wherever, in their judgment, it is advisable. That seems to be the only way in which this method can ever touch the problem to any efficient degree. The present laws apply only to persons in institutions and cannot reach the most important group.

I have said that this quarter of a million, this army of feeble-minded people, are propagating. They are propagating a progeny of feeble-minded at somewhere from two to six times as fast as the intelligent people are propagating their kind. That is another serious part of the problem. I should like to digress from my particular field for a moment to make a suggestion on the other side. It makes one feel pessimistic when we find that the good stock here in New England—the stock than which there is no better in the world—is gradually disappearing for lack of issue. Of one family after another one reads all too frequently, "The last of his family has passed away." We are told sometimes that two children in a family are all that can be properly reared; that it is better to rear

two children and rear them properly than to rear a larger family and rear them badly. If *two children in a family* are all that our best and finest and nobler families can properly raise, *how many children* ought to be raised in a family of these low-grade people? The average in the United States is, for all classes, something less than two, and the average for these defectives is from four to twelve. In that little family that we ran across down in New Jersey, which we call the Kallikaks, you will recall that the good side started from six ancestors. That is to say, Old Martin Kallikak, after he married, had seven children, one of whom died without marrying. From the six who lived and married, sprang all the normal descendants. Martin's illegitimate son, the child of the feeble-minded girl, was the only one on the bad side, and yet today the number of descendants from the illegitimate mating is practically the same as the number descended from the six legitimate children. You can see that it does not take many generations for the progeny of the unrestrained feeble-minded to equal and even outstrip the normal. Our good stock is multiplying very slowly. Our poor stock—the lowest strata of society—multiplies in what might really be called a brutal ratio. If civilization is to advance, our best people must replenish the earth. I think it should be a part of our religion to replenish the world with good, clean people.

But there is still another point in the menace of the mental defective from the standpoint of heredity. Not only are there a quarter of a million people propagating much more rapidly than the general population, but they are propagating according to the Mendelian Law. That law shows that the transmission of traits is much more complex than has been suspected. Those who tell us that if we could sterilize we should eliminate feeble-mindedness in a generation or two, have not considered the method of inheritance of feeble-mindedness. I want to call your attention, briefly, to the difficulties of dealing with inheritance under the Mendelian Law.

There are six possible kinds of matings, giving rise to six kinds of families. If a normal man marries a normal woman, the children are all normal, and out of the six possibilities, that is the only one that is entirely good. Second, if a feeble-minded man marries a feeble-minded woman, the children are all feeble-minded. In this case the only hope is segregation or sterilization of all the children. Third, if one parent is feeble-minded and the other normal, all of the children will be normal, but "simplex," that is to say, they will inherit their normality from only one parent, not from two, which means that while they themselves are normal, *they can transmit their defect*. It will be seen that we could not sterilize any of these under any law that we now have. If they are not



feeble-minded they cannot be segregated, and yet every time they marry there will be some feeble-minded, as you see in the next group.

From a marriage between two people, each of whom has inherited feeble-mindedness from one parent, what do we have? Three normal to one feeble-minded, but of the three normal only one is duplex. Only one child out of four who can never transmit feeble-mindedness. The family comprises, therefore, one feeble-minded person, two that can transmit defectiveness, and one that cannot.

In the case of one of those normal persons who can transmit defectiveness marrying a duplex normal person, all the children are normal, but *one half of them can transmit defect.*

Now the point that I want to make in all this is the enormous complexity of the problem. It is evident that out of all those cases, there are only a very few where we know, or can know, enough to take any action. People who have been reading about eugenics have discovered that there is something in heredity, write to us, stating certain conditions and asking, "Is it safe for me to marry this particular individual?" Up to date I have not had a single case presented to me in which I could say, "If you marry, there is an even chance that your children will be feeble-minded," and yet I have had some cases presented to me that were dubious. We do not know; we cannot tell.

We need to know vastly more than we know today before we can give definite answers, except in the case of marriage between two feeble-minded persons. Now, that being the case, the argument that I want to make to you is: the propagation of the feeble-minded is going on at an enormous rate. If we could do, and if we did, everything that we wanted to do, and that we knew enough to do, we should be getting only at the surface of the problem, and should be sure in only about one case out of the six possibilities. Now if that is the case, my friends, does it seem that we ought to put off attacking the problem until we cannot stand it any longer? Or does it mean that we had better attack it right away? Is it not best to begin hunting for these defective children wherever they may be found? And they can be found in the school, in our juvenile courts, in our almshouses, in our insane hospitals, in our reform schools, in our homes for cripples, in our asylums for the blind,—in short, wherever there is a dependent group there is an undue proportion of these mental defectives.

Some will say, "If they are in almshouses they are being cared for." In reality they are being raised and brought to manhood and womanhood and then sent out, to propagate their kind. Fifty years ago the problem was not as serious as it is today, because these defectives were out in the world by themselves, getting killed by a runaway horse, or falling into machinery, or in some way meeting an

untimely death. Today we are exceedingly careful; we are protecting them in every possible way; we are taking care of them in our institutions and giving them every advantage, and then sending them out into the world—a menace to the rest of humanity.

It would be a dreadful thing if all these problems were solved and we didn't have any people to give our money and charity to. I suppose we should become hard-hearted if we didn't have any to befriend. Perhaps we want to keep enough of these unfortunates so that we can still contribute to their safety and welfare. But, my friends, when we realize the suffering, the terrors, the losses of all kinds that these people unintentionally, unwittingly cause us, we have another side of the problem. The menace of the feeble-minded is not a figure of speech. It is no undue sentimentalism that assures us that we need to take care of this group of people. We need to study them very seriously and very thoroughly; we need to hunt them out in every possible place and take care of them, and see to it that they do not propagate and make the problem worse, and that those who are alive today do not entail loss of life and property and moral contagion in the community by the things that they do because they are weak-minded.

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<sup>2</sup> Mental Preparedness. By James J. Putnam, M.D.

## THE FUNCTIONS OF SOCIAL SERVICE IN STATE HOSPITALS.

By HANNAH CURTIS, HATHORNE, MASS.

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THE different conceptions which people may entertain as to the meaning of social service doubtless depend upon the form of the work with which they are most familiar. The oldest and best known work is that which is connected with settlements, children's agencies, relief societies, industrial welfare work, etc. The best general definition of social service is possibly that of Prof. Peabody of Harvard University. He writes, "Social work is not merely a question of enthusiasm, sympathy, self-sacrifice or money, but it is a question of wisdom, discretion and the scientific interpretation and comparison of facts." This statement defines the work in a very broad sense,—possibly the whole is better understood when a single branch of the work is described in detail; however, it must be well borne in mind that the underlying principles are practically the same in all forms of the work, the aim and purpose being a common

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one, namely, that of the betterment of the human family.

One of the more recent developments of social work is that of Medical Social Service, which Dr. Richard C. Cabot thus defines: "Medical Social Service was organized in order to help the patient in his *real need*, of which sickness might be a mere incident. The real need may be his ignorance, recklessness, poverty, discouragement, feeble-mindedness, or loneliness. The social worker understands the real need only when she learns four things: (1) the bodily state of the patient, his diagnosis and prognosis; (2) his mental condition; (3) bodily environment, which includes work, wages, housing and clothing; (4) his mental environment, which includes the influence, good or bad, of family, friends, enemies, and neutral companions. All this involves a sympathetic study of the patient in his home; a personal, intimate knowledge is absolutely essential. This work must be based on real, friendly interest; no fake interest is effectual."

A highly specialized branch of medical social service is that which has recently been established in State hospitals for the mentally diseased. The principles underlying this work are identical with those of the general hospital service, although the methods of the work may differ somewhat, owing to the nature of the disease under consideration. Before plunging into the functions of social service in the State hospital, it might prove beneficial to consider the *hospital* first and to note some of its needs.

One frequently hears the word *asylum* used in connection with the State institutions for the mentally diseased. It is true that this word was formerly attached to institutions of this kind, and rightly so. We understand the word *asylum* to mean a place of refuge or sanctuary to which debtors and criminals formerly fled that they might secure immunity from arrest; the asylum was also an institution in which the aged, destitute or afflicted might find relief and care. Persons who entered the asylum were expected either to die soon or to remain there for life. Our conceptions of State institutions for the mentally ill have been somewhat colored by former methods and customs of the *asylum*; consequently we frequently hear the words "hospital" and "asylum" used interchangeably, many apparently believing them to exist for the same purpose, which is not the case. The word "hospital" conveys an entirely different meaning, mainly because it is different in every respect.

The most vital function of the hospital is curative and reconstructive; it aims to cure or help the patient, and rebuild his life as far as possible. The principle of segregation is not by any means the leading one. The asylum is a place of refuge; the hospital exists for the treatment of the patient and the rebuilding of his life.

Many patients leave the hospital doors to return to their previous occupations; many more to return to home life under more or less supervision. Granting it to be true that the hospital exists for reconstructive purposes, it becomes very obvious that the institution must gather facts with which to reconstruct the lives of its patients, especially so when it becomes necessary to create a wholesome environment to which the patient may return after a prolonged stay in the hospital. The modern medical man realizes the importance and value of the social aspects of disease and their bearing upon the treatment of the patient. As these social aspects are closely intertwined with physical and mental conditions the gathering of social data becomes an important part of the hospital equipment. Then, too, the hospital exists, or should exist, for the benefit of the community in which it is located, and should be in close contact with that community in order that people may easily secure advice as to home treatment or home conditions which have a medical bearing. All this means social work, and doubtless the introduction of social service into the State hospital was the development of the realization of these needs. By means of this department, the hospital is better able to fulfil the purpose for which it is established.

With this brief insight into some of the needs of the hospital and its patients, we may now consider more in detail the functions of social service and what it is attempting to do.\*

There are four main divisions into which the work falls: first, the home-visiting or after-care work; and closely identified with it the systematic visiting of patients who are boarded by the State in private families. This feature of the work is quite important and enjoyable. A personal, intimate knowledge of the patient is thereby made possible. It is a rare instance when coöperation is lacking, as the large majority of patients are highly appreciative of the interest shown by the hospital authorities.

James B., 23 years of age, single, residing in a large city, was a patient at the hospital for several months; mentally he was considered to be below the average. His occupation was that of usher in a theatre. His father is a chronic alcoholic and has served no less than 12 terms in the House of Correction, where he is at the present time. James' mother was also somewhat weak mentally, and therefore unable to understand James and his ways. He had no ambition to work steadily or to learn a trade, preferring to read, or rather to devour, cheap novels, and to smoke cigarettes. He had other wasteful and undesirable habits which were a trial to his family. Soon after he left the hospital a home visit was made and the relatives advised as to methods of home care. Inducements were persistently offered to James to find some kind of steady work, which proved successful, for at present he is steadily employed earning about \$8 a week and considers himself very much of a man,

\* The work described refers to that of the Danvers State Hospital.



for he now contributes a little to his family. Several home visits were necessary, but the family was coöperative, which accounts largely for the results.

Another instance of a somewhat different nature is that of Martha W., who was diagnosed as an alcoholic and mental defective. Martha W. is 33 years of age; of Irish nationality; married; has one son of 8 years. Husband is a waiter and earns good wages. Martha has a sister who is a moral degenerate and is now serving time. Patient was more or less under the influence of this sister, who is considered largely responsible for the drink and drug habits which our patient had contracted. Soon after leaving the hospital Martha's husband declared his inability to care for her properly as she had resumed her former habits. The husband requested assistance; a long interview with him revealed the fact that he had tried harsh and stern measures with his wife, who naturally resented this treatment and turned against him. She possesses an inborn sense of artistic housekeeping, and is strongly attached to her son. Using these as incentives, attempts were made to help patient to overcome her habits through the development of her natural instincts; the husband's coöperation was earnestly sought and obtained. A recent home visit found patient much happier than at time of first visit, more contented with her home and less vindictive toward her husband. Her habits as to the use of alcohol and drugs are not yet overcome, although she uses both in great moderation as far as could be learned.

Numerous cases could be cited illustrating the value and nature of the home visit, in which patients are aided in meeting the difficulties or obstacles which may hinder health or happiness. Friendly advice and encouragement are effective agents in the home-visiting work. In a few cases coöperation is not established, either through fear and ignorance of hospital methods, or because of a low order of intelligence in the family.

Such was true in the case of Isaac G., a young Jewish man suffering from an incurable form of mental disease. After staying in the hospital for some time, Isaac's people desired his release, assuring the physicians that they could give him good home care. A home visit was made several weeks later, but the family were apparently away. Inquiry of a neighbor as to their whereabouts brought forth a story which indicated that Isaac was being abused and neglected by his relatives. These relatives were located by the visitor and interviewed. They volubly declared, with many characteristic gestures, that Isaac was living with a wealthy uncle in New York, who was employing him at a princely salary; their statements during the interview were very contradictory; the mother feigned ignorance of the English language and refused to admit the visitor to the house. A police officer was secured and the house entered amidst voluble protests. The home was in the Jewish tenement district of a large city; the rooms were small and dark, and very disorderly and dirty. In a small rear room, containing a chair, a table and a heap of soiled clothing, we found our Isaac concealed. The room was without heat, in the cold season of the year. From beneath the heap of

soiled bed clothing peered the white, scared face of our Isaac, where his brother had hastily concealed him, for he was absolutely nude. Isaac was emaciated, pale and weak from lack of food and from frequent beatings, which, by the way, were administered to cure him of his delusions, referred to by the family as "foolish talk." He was removed from the house and taken to the station to await help from the hospital in returning him. This is an extreme case, although a true story.

Leaving the department of home visiting, which is most interesting from the educational point of view, we will consider the next division of work,—that of taking medical histories outside the hospital. These generally include the social situation, and when necessary, a description of the home conditions. The medical history is essential in order that a satisfactory diagnosis may be possible. When the hospital physician is unable to secure such information, then the social worker goes into the community and seeks it. It frequently happens that cases of distress are located in this work and alleviated. Robert K. was such a case. No history could be obtained by the physician as no relatives of the patient had called at the hospital. A call at the home resulted in finding our patient's wife in a very poor physical condition, surrounded by a family of three young children, all in school. The eldest girl was apparently developing tuberculosis; the wife was unable to work and the income had ceased when the patient came to the hospital. Relief was secured for the family, as to food, fuel and rent. Winter clothing was provided for the children. Medical aid was secured for the wife and daughter. In a comparatively short time the wife was able to find work and partly support her children. She is practically free from the worry and anxiety which was undermining her health. This is in reality a form of preventive work and quite important.

The third division of the work is that of investigation, to which there are four aspects: (a) investigation of home conditions previous to discharge of patient; (b) investigation of complaints relative to patients; (c) investigation of all applications for patients to board in private families; (d) a special form of investigation which relates to the social aspects of special diseases, as pellagra. Investigation is not as undesirable a thing as many suppose; it is in reality the securing of facts which will benefit the patient, the hospital, and the community. One of the most important forms of investigation is that of the home conditions previous to the discharge of patients from the hospital. This does not necessarily mean a scrupulously clean house, a large income, good food and clothing although these are important. It more specifically means that some responsible person must be in the home who appreciates the condition of the patient and understands, in a measure, how to give the proper home care. If



the patient is unable to work, there should be sufficient income to support him; if he can work, something definite should be done to make work possible; the neighborhood environment should be conducive to health, and the home environment should be such that the patient may be able to keep in as good a condition as when he left the hospital, other things being equal. When home conditions are unfavorable, the social worker should attempt to improve them so far as possible. In some cases this cannot be accomplished. One instance in which it was done successfully will illustrate the work.

John S., 38 years of age; American born; shoe-worker; widower with eight children. This patient had used alcohol to excess for a short time, and this was an important factor in his case. Investigation revealed the fact that inadequate income and sickness had made it impossible for this patient to supply his family with sufficient food. He frequently went to work without food, substituting a breakfast with a glass of beer. Loneliness, discouragement, inadequate income and sickness, were the real needs in this man's case. The house in which he and his family lived was in the midst of a saloon district; the rooms, six in number, were small, meagerly furnished and extremely untidy. Sanitary conditions were far below the standard; five children were sleeping in one small attic room; the eldest, a boy of 19 years, was tubercular in appearance and complained of ill health. A daughter of 16 years was acting as housekeeper, had received no training, and had left school at 14 years of age to help at home. This little flock of motherless children, whose father was a patient at the hospital, was supported by the small wages received by the two older boys, averaging about \$12 a week, \$3.50 of which went to a relative for rent, an exorbitant rent for value received. The inadvisability of returning a patient to these conditions is very obvious. The family was advised to move, and guidance and financial assistance were secured to enable them to do so. A friend promised to see that patient secured work when able to leave the hospital. Urgent appeals are being made for a middle-aged woman to keep house and help in the training and care of the younger children. The family is now living in a new, comfortable tenement in a good neighborhood; they are united and happy. Frequent home visiting will be necessary for some time, for this is an example of reconstructive work previously mentioned.

Other forms of investigation refer to complaints relative to patients, either received directly from them or from some other source. Quite a different form of investigation is made relative to the boarding-out of State patients. All applicants are interviewed. The fundamental parts of this form of investigation refer to the location of the home, the neighborhood and home environment, hygiene of the same. The art of housekeeping is quite important, but not as essential as the hygiene and habits of the family, the plan of home treatment, and the attitude of the proposed caretaker toward her prospective patients. The patients are studied,

their peculiarities noted and, as far as possible, are placed accordingly. These patients are visited systematically and dealt with according to the situation found at the time of visit. They are returned to the hospital when it is advisable to do so.

Another branch of social work in the hospital is that of connecting needy persons with the proper agencies. Many who are committed to the hospital are mothers or bread-winners of families, which means that dependent persons are left without means of support.

Josephine W., 30 years of age; married; American born; good education; became a victim of alcoholic insanity. She was the mother of two boys, aged 4 and 2½ years, respectively. When Mrs. W. came to the hospital these children were left in the care of their father, who was also an alcoholic habitué. This case was referred to the hospital by an outside physician, who considered the situation a serious one. Following an investigation, the guardianship of the children was transferred to a paternal uncle, and they were placed in a good home. Shortly after this it became necessary to commit the father of these children to the hospital, where he remained for several months. Both improved and are out of the hospital on visit. They are both doing very nicely; the man is seeking employment and hopes soon to restore his home and to receive his children. They are eagerly looking forward to this time and sacrificing in order to have the home which they so carelessly destroyed through dissipation. They are trying very creditably to reconstruct their lives and are being encouraged in so doing.

There are many instances when the bread-winners of families become patients, and their families are without means of support; these are connected with relief agencies and a permanent plan formed. Several patients need help in finding employment after leaving the hospital; these are sent to employment bureaux or to special firms, as the case may be. Other patients need to be connected with persons or agencies who will aid them in the moral sphere; others need proper recreation; still others need special physical attention, and are connected with general hospitals for treatment.

The recent establishment of the out-patient clinics is a new field for the State hospital. These clinics are held weekly in the larger cities of the district. Patients who are out on visit are invited to report and to seek such aid as they may require. Through the out-patient clinic the methods of the hospital may be more clearly understood. The advantages of consultation are open to those who are interested or in need of information.

The main divisions of the work are: (1) home visiting or after-care work of patients who are living in the community; (2) the securing of histories outside the hospital when the same cannot be secured in any other way; (3) investigation of various kinds which aid in the care



and treatment of patients in the hospital, and in reconstructive work when they leave the institution; (4) the connection of needy persons with the proper agencies, such as hospitals, associated charity organizations, churches, children's agencies, or whatever. It will be observed that all parts of the work bear upon the social welfare of the patient, which benefits both hospital and community.

Results are sometimes difficult to determine in social work, inasmuch as one deals with silent forces. Reference has already been made to the real needs of patients, which are frequently those of ignorance, recklessness, loneliness, discouragement and poverty. Some results noted are those of the changed attitude of the community toward the hospital, a more intelligent comprehension of hospital methods and purposes, a broader knowledge of mental diseases and their treatment, more reconstructive work in connection with the patients who leave the hospital. The friendly interest taken in the patient's welfare reveals the humanitarian spirit, and reacts favorably upon the patient and his family. The scientific methods of home care enable many to live in the community who would otherwise be obliged to remain in the hospital. The social data obtained for the hospital may prove to be a valuable contribution to hospital service. There is a financial aspect to social service in this line of work, in spite of the fact that the monetary value of a human being cannot be estimated. The expenditures of the hospital must, in the course of time, be lessened somewhat by the increased number of patients who may live in the community under supervision, to say nothing of the preventive work which may be accomplished through this department. Alcoholism and syphilis are contributing factors to certain mental diseases which are largely preventable, and the field for preventive work of this kind looms large before us. Closely connected with preventive work is that of finding employment for the mentally handicapped,—a large and very important part of the work.

The educational feature of social work in the State hospital is a most interesting one; such knowledge as the hospital may gather should be for the benefit of the public and should be within its reach. The social service department acts as a sort of connecting link between the hospital and the community. Interest is aroused and attention is called to mental diseases and the methods of treatment. Social agencies, especially relief agencies, which frequently spend large sums of money in endeavoring to place a sub-normal person on a normal basis, are now taking into consideration the mental condition of persons who seem to be failures. These failures, which frequently have been attributed to "pure encephalopathy," as a worker recently remarked, may now be better comprehended when an examination proves the person

to be of low mentality and utterly unable to do the work of the average man or woman. The bringing together of the hospital and the community is educational to both and beneficial to all. The basis of medical social service is knowledge of the patient and his environment, secured only by a sympathetic study of the patient in his home. This implies that the spirit of social service is altruistic as well as scientific, for as Dr. Cabot states, "The work is based on real friendly interest"—friendship in its truest form, for it is service with the selfish element eliminated.

When one considers that the entire amount of work accomplished is but a mere "drop in the bucket," in comparison to the amount of work that is left undone, the only inspiration that can be derived from this kind of work is to forget the bucket and to remember the "value of the drop" which the bucket contains.

The functions of social service in State hospitals are threefold: to ascertain the real needs of the patients from a social point of view, and to seek for remedies which will alleviate or cure; to obtain such knowledge of the patients as will aid the hospital to render efficient treatment and after-care of all persons who enter its doors; and to extend such knowledge into the community as will be of common benefit to society in the consideration of mentally affected persons and their problems.

The development of social service spells efficiency, and its success depends upon the co-operation of the community through the individual. When the individual realizes that the problem of the hospital is *his* problem, and that the privileges and duties of true citizenship include the earnest and conscientious consideration of the social causes of ill health, then, and not until then, can society hope to realize the full meaning of efficiency and development, whether it be in the economic field or in the intellectual world, or in the moral sphere. No man can live entirely to himself except it be an isolated case like that of Robinson Crusoe, and then not even he could live entirely to himself after his man Friday joined him.

TREATMENT OF BURNS. Report in a recent letter from the French front describes the beneficial use of ambrine in the treatment of extensive burns, especially of the face and hands. Ambrine is a mixture of wax, paraffin, and resin, with a melting-point of 120° F. It is applied to the burned area at this temperature with a brush, or sprayed on with a syringe, and forms an impermeable coating over the entire surface. The peeling off of this layer once or twice daily, and its reaplication, are said to be almost painless, and the method is avowed greatly to minimize scarring. If these statements are confirmed, ambrine may prove of great value in treatment of burns in civil life.



## Reports of Societies.

### NEW ENGLAND PEDIATRIC SOCIETY.

A MEETING OF THE NEW ENGLAND PEDIATRIC SOCIETY WAS HELD AT THE BOSTON MEDICAL LIBRARY ON MAR. 3, 1916; THE PRESIDENT, DR. A. C. EASTMAN, OF SPRINGFIELD, WAS IN THE CHAIR.

The following papers were read:

#### I. THE AMOUNT AND DURATION OF FOMITES INFECTION IN DIPHTHERIA.

By E. H. PLACE, M.D., H. H. AMIRAL, F. D. JONES, M.D., BOSTON.

#### II. SPASMOPHILIA, WITH ESPECIAL REFERENCE TO ITS TREATMENT.

By J. P. SEDGWICK, M.D., MINNEAPOLIS, MINN.

#### DISCUSSION.

DR. ENGLISH (Dr. Place's paper): 'Dr. Place's paper coincides with more recent investigations in regard to the transmission of diphtheria. I think most of the recent investigations are usually or have been along bacteriological lines rather than along clinical lines. Since the diphtheria bacillus was discovered, and since the discovery of antitoxin, the mortality from this disease has markedly diminished. Diphtheria mortality averages in most places from 5-15%, which is still high. The diphtheria bacillus is said to lose its virulence when apart from the body tissues, and, when exposed to sun-light or dryness, dies within a few days. The question may then arise why we have so many fresh cases of diphtheria when we have these known factors? The reason is that so many carriers are going about. It is known that about 1 to 5% of the community are still diphtheria carriers, many of whom harbor the organism for many days after the membrane has disappeared from the throat. This is the chief reason why people, going about with the diphtheria bacilli in their nose or throat, are still keeping up the disease. These carriers who are harboring the virulent or non-virulent organisms are the ones who are transmitting the disease. Some investigators believe that true diphtheria bacilli have a power of losing their virulence even after an attack of diphtheria and under favorable conditions for growth may be transformed again to virulent bacilli. The vast number of bacteriologists claim, however, that true diphtheria bacilli are distinct organisms and that the diphtheroids are not pathogenic and do not cause true diphtheria. Boards of health in the largest cities no longer fumigate houses where diphtheria has been present, and do not fumigate for measles or chickenpox, and in some places not for scarlet fever, because of the fact that the life of the organisms which cause these diseases is short after leaving the body tissues.

We note from the Schick test that there are a number of people known to have natural immunity to the disease, about 80% of infants, 40-60% of children, from one to fifteen years of age, and about 80% of adults. This leaves only a small part of the susceptible people, and it would seem as though with this knowledge that the mortality from the

disease ought to be lower than 10%. The fact remains it has been about the same for the past ten years.

I think one reason why carriers go about transmitting the disease is that the examination of children and of infants, who may have the disease in mild form, is not thorough. Some examine only the heart, lungs and abdomen and do not examine the throat. There is also a vast number of men who do not examine the nose. I had the experience in South Department to take practically all the histories of diphtheria, and it was my experience there that because the child did not complain of a sore throat or have any difficulty in swallowing liquid or soft solid food, the throat was not examined. I think I had taken histories time and time again where for three or four days no thought of the child having diphtheria was present in the mind of the family or even of the physician, until the child began to have a markedly swollen neck, or septic odor to breath, which are characteristic of septic diphtheria.

The examination of noses, I think, is less frequently done. It seems to me that no regard was paid to the possibility of the discharge from the nose as being diphtheritic unless it was a hemorrhagic discharge. A child may have a perfectly clear mucous discharge and that discharge be diphtheritic as often as streptococci or staphylococci.

There is one other investigation which is being done at present, that is the possibility of inoculating the community by giving them small doses of toxin and antitoxin,—mixtures to procure an active immunity to diphtheria which will last much longer than the passive immunity given by antitoxin which is usually three weeks at the most. This is the von Behring active immunity test. This offers great hopes for a lessened mortality, because in the cases thus far reported, an immunity for a year or more may be had. The question of diphtheria mortality still needs and requires a great deal of publicity and education on the part of the public.

DR. WESSELHOEFFT (Dr. Place's paper): A confirmation of the small part played by fomites in the spread of diphtheria is, I think, to be found in scarlet fever wards. Here it is not infrequent to find diphtheria as a secondary throat infection either at the onset or during convalescence. In fact, scarlet fever apparently tends to increase the susceptibility of an individual to diphtheria. Yet in spite of this, and in spite of the frequency of diphtheria carriers in scarlet fever patients, a case of diphtheria in our scarlet wards at Brighton does not mean an epidemic as in the case of the occurrence of measles or chickenpox in these wards. Diphtheritic throats often stay in these wards 24 to 48 hours before they are diagnosed and isolated, yet the disease does not seem to spread to others. Disregarding the consideration of droplet infection in this point, we must admit that the neighboring beds and other objects about the ward must become contaminated before the patient is isolated or barriered. Consequently, I am led to believe that fomites cannot be of much importance in the spread of diphtheria.

DR. PLACE (in closing): It seems to me it is incorrect to consider fomites as playing more than a small part in the transmission of diphtheria, but I think it is a mistake to ascribe so much danger to carriers as is at present done. Dr. English's statement, that from one to five per cent. of the people in the street are harboring the organism, is correct but it has never been proved that these cases harbor



the true diphtheria bacillus in that proportion, or that they are capable of transmitting diphtheria. Diphtheroids are very frequently found, and it is impossible in routine diagnosis to exclude these, particularly in the so-called carrier group. In all studies of carriers, a certain proportion, often considerable, and in some instances nearly a hundred per cent., have been shown to be harborers of non-virulent organisms.

I believe, therefore, that diphtheria is far more frequently contracted from a patient ill with the disease, particularly the mild type, and especially when the nose is involved, than from carriers.

DR. TALBOT (Dr. Sedgwick's paper): We speak of spasmophilia and of the spasmophilic disturbance in a very loose manner, and I note that Dr. Sedgwick brings in the question of asthma into this group. I haven't done any work on electrical irritability, so I cannot speak on that phase of the subject, but I feel that a large number of cases of asthma can be explained by anaphylaxis. Many other men feel the same way I do, and the reason we feel so is that a specific skin test to various proteins can be obtained. Furthermore, when such a food is ingested or the powder of such a protein is inspired, an attack of asthma immediately follows in a sensitive individual. It would seem to me that the heightened irritability which Dr. Sedgwick gets in these cases was probably secondary or incidental in cases of asthma.

I want to ask Dr. Sedgwick whether he has tasted calcium chloride; I have tasted it and I wonder how these delicate babies can retain it.

DR. WEBSTER (Dr. Sedgwick's paper): I feel that Dr. Sedgwick's paper is very valuable. I should like to ask Dr. Sedgwick if he considers it possible that the beneficial action of calcium chloride is due to the prevention of intestinal fermentation? Also I should like to ask him if he has found calcium chloride particularly constipating?

DR. MORSE (Dr. Sedgwick's paper): I haven't anything to add to the discussion of Dr. Sedgwick's paper except that I am surprised at the size of the dosage given to these infants.

DR. LADD (Dr. Sedgwick's paper): In Eschscholtz's tabulation of 240 cases of tetany, a strong seasonal variation was shown, the cases increasing from November to April, as follows: November 21, December 16, January 29, February 51, March 59, April 45, May 10, with only occasional cases from June to November. Did Dr. Sedgwick observe such a seasonal variation in his cases, and can he explain this incidence of the disease?

It has also been claimed that peripheral nerve irritability can be diminished either by increase in calcium salts or by diminution of sodium salts. Has Dr. Sedgwick made any observations in his cases as to the effect of the reduction of sodium salts intake on the electric irritability of the peripheral nerves?

DR. DUNN (Dr. Sedgwick's paper): It is very hard to discuss a subject that Dr. Sedgwick has studied so thoroughly. It seems to me if any objection can be raised at all as to the conclusions drawn in Dr. Sedgwick's paper, it is that it is very difficult to draw conclusions as to therapeutic results in any diseased condition which has no normal or established course.

I have had recently at the Infants' Hospital several cases of spasmophilia which have been studied on the basis of such symptoms as tetany and the

various signs of nervous irritability which can be found on ordinary physical examination. Many come in with the history of repeated convulsions for long periods of time, and after entrance to the hospital, without treatment, have no more convulsions. Other cases come in with the same history and continue to have convulsions steadily for a long time after entering the hospital and then suddenly stop. Many cases stop having convulsions and showing signs of spasmophilia abruptly without any relation to treatment. It seems to me that cases of spasmophilia are apt to run a very irregular course. There are so many spasmophilic cases of short duration that it is extremely difficult to draw conclusions as to the probable cause of the sudden cessation of the symptoms, or attribute the result to the therapeutic measures employed.

The fact that the calcium metabolism in spasmophilia bears a close resemblance to that of rickets is of great interest. I am not so familiar with the work done on spasmophilia as I am with that done on rickets because I have been going over the subject of rickets lately. I am very strongly inclined, as far as rickets is concerned, from the evidence I have been able to gather, to believe that rickets is due not to diet, but to faulty hygienic surroundings. In spasmophilia I used also to think it was due to the diet, but now I do not think that the relation to diet is very definitely established. I am more inclined to believe that spasmophilia also is very commonly associated with faulty hygienic surroundings, and that this is an important contributory cause. The disturbance of calcium metabolism is, like the tetany, a result rather than a cause, and I am very doubtful whether spasmophilia can be influenced by the giving of calcium any more than can rickets.

DR. SEDGWICK (in closing): In regard to the seasons having effect upon the occurrence of spasmophilia, I would say I think the occurrence of this condition undoubtedly varies with the seasons. The manifestations are much more frequent in the early part of the year. I do not think all asthma is spasmophilial.

I do not believe that the beneficial action of calcium chloride is due to prevention of intestinal fermentation.

I find that the administration of calcium chloride is at times associated with constipation.

## Book Reviews.

*The Medical Clinics of Chicago.* Philadelphia: W. B. Saunders Company, May, 1916.

The May number continues the Medical Clinics with the same methods of presentation. The special cases discussed are always interesting. In this particular number there is a good discussion of the Allen Treatment of Diabetes with illustrative specimen diets.

The well-rounded presentation of some clinical subject is apparently being developed by the Medical Clinics. When backed up with case reports, the combination ought to be of more interest and value than the presentation of case reports alone.



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126 Massachusetts Ave., Corner Boylston St., Boston, Massachusetts.

## DEATH OF DISTINGUISHED SURGEON.

It is with regret that the JOURNAL records the passing of one of the best-known surgeons of this country. The sudden death from heart trouble of Dr. John B. Murphy of Chicago, at the age of 58, takes from American medicine the services of one of its leaders. Dr. Murphy was born in Appleton, Wisconsin. He graduated from Rush Medical College in 1879, and as Professor of Surgery in Northwestern University, and Surgeon of the Mercy Hospital in Chicago, he occupied an important position in medical education in this country. He was a general surgeon of ability and originality. Among his contributions to surgery, the Murphy button for intestinal anastomosis and the importance of enteroclysis in infections of the peritoneum are, perhaps, the most familiar. His work with bones and joints is almost of equal importance.

Dr. Murphy was president of the American Medical Association in 1913, and the same year

was elected president of the Clinical Congress of Surgeons of America.

He held the degree of LL.D. from Illinois, and that of Doctor of Science from Sheffield, and was a Fellow of the Royal College of Surgeons. He was recently knighted by Pope Gregory for his researches in surgery.

Last year he organized an American unit to serve with the British Army in France. His death closes the career of a really great surgeon.

## MENTAL DEFICIENCY AND ITS REMEDY.

THE present issue of the JOURNAL contains a group of papers, by well-known experts, on various aspects of mental hygiene. Perhaps the most immediately practical of these is that with which Dr. Goddard deals as "the menace of mental deficiency from the standpoint of heredity." The essence and importance of this menace lie in the relatively rapid propagation of the feeble-minded compared with other classes in the community. Formerly, when all stocks were equally prolific and the mentally deficient were more exposed to eliminative accidents, natural process served better to maintain a balance. Now, as Dr. Goddard points out, the feeble-minded are more protected by society from disaster; and the steadily declining fertility of superior stocks tends to destroy this advantage. Optimists believe that the relation will yet right itself; but there seems, nevertheless, occasion for very genuine and serious concern, unless additional measures are taken to correct the disturbance of evolutionary process created by modern protective measures, which favor the survival of the unfit, and by modern practice which limits artificially the number of fit who survive.

Broadly speaking, such corrective measures may be of two kinds.—those which tend to restrain the inferior, and those which tend to increase the superior, stocks. Doubtless both of these should be applied. Dr. Goddard naturally emphasizes the former, but he calls distinct attention also to the latter, which, as the positive side of the picture, perhaps deserves even more iteration. One of the evils of so-called birth-control, of which so much is heard, is that it affects the wrong end of the scale. What is needed is an awakening race consciousness, or perhaps one would better say, human consciousness, which shall realize the duty of suppressing



the undesirable and augmenting the desirable stocks. This is the only type of artificial which can properly supplant natural selection. This is true aristogenics. But for its realization concerted conviction is essential. If the present European War has yet shown the world anything, it is, as Dr. Putnam points out, that highly organized social efficiency is indispensable for the ultimate success of civilization and attainment of human ideals.



## POLIOMYELITIS AND ITS TREATMENT.

DURING the past week there has been a steady continuance of the various epidemics of poliomyelitis in the United States, and several new foci of the disease have developed. On August 19, the number of cases in New York City reached a total of 7006 with 1597 deaths. In New York State, outside New York City, there were, up to Aug. 11, 881 cases and 80 deaths.

In Massachusetts, the total number of cases on August 19 was 128, of which 17 have been in Boston, 11 in Westfield, and 21 in North Adams. In New England, outside Massachusetts, there have been three cases in New Hampshire, 41 in Rhode Island with 7 deaths, and 238 cases in Connecticut with 37 deaths.

Outside of New York and New England, there had been on August 11 over 1300 cases in New Jersey, 212 in Pennsylvania with 54 deaths (an unusually high percentage), and 40 in Chicago. On August 11, Dr. Samuel G. Dixon, health commissioner of Pennsylvania, in the following letter notified Dr. Allan J. McLaughlin of Massachusetts, that the Commonwealth of Pennsylvania had established quarantine against all exposed children from beyond its borders:

"The Commonwealth of Pennsylvania this day placed quarantine against all children under 16 years of age coming from outside the commonwealth, who have had, or have been in contact with infantile paralysis, or who have been living in premises in which there is or has been a case of infantile paralysis during the present epidemic. Other children less than 16 years of age from any stricken district will be held under observation. We trust you will advise all officers of railway stations to warn those affected by this regulation who may desire to come into Pennsylvania.

"I shall be greatly indebted to you if, when your state officers or local health officers in the state report as to the condition of the health of children under 16 years of age, you will have

them give specifically the facts with reference to probable exposure by being in direct contact, a resident in the same dwelling in which a case is under treatment, or if they reside in a stricken district. These facts will be required by the department officers in order that the inconvenience of restricted movements and supervision may not be imposed."

Mr. Richard T. Crane, Jr., of Chicago, has offered a reward of \$25,000 to the physician who, within the next year, shall produce the best cure or preventive of poliomyelitis, the award to be determined by a majority vote of the American Medical Association.

On August 10, a meeting of prominent residents and physicians of Nassau County was held in Roslyn, L. I., at which the sum of \$40,000 was subscribed towards a fund of \$100,000 to combat poliomyelitis throughout the United States. It is proposed to establish a laboratory for this purpose in charge of Dr. George Draper.

In Massachusetts, Dr. Walter H. Brown, epidemiologist for the State Health Commission, and an officer of the United States Public Health Service have been detailed to make an eight weeks' field investigation of the disease in this state. Dr. W. H. Frost, of the Public Health Service, has been detailed to coöperate with local officials in a similar research in New Jersey. Meantime, a national conference of state and territorial officials was held on August 17 in Washington, D. C., under the auspices of the United States Public Health Service, to standardize methods of combating poliomyelitis throughout the country.

In last week's issue of the JOURNAL, we commented editorially on two recently suggested methods of treating poliomyelitis, by intraspinal injections of adrenalin and of quinine and urea hydrochloride, respectively. Another new method which has recently been employed in New York is the use of immune serum from patients recovered of the disease. The Department of Health of the City of New York has issued the following circular statement about this so-called treatment of poliomyelitis:

"Among the various methods advocated for the specific treatment of poliomyelitis, several deserve mention as being based on sound scientific principles. One of these consists in using the fluid withdrawn by spinal puncture in intraspinal injections, subcutaneously or intracranially, into the same patient. This method is based on the assumption that the spinal fluid withdrawn from the patient contains the virus of the disease.



ease, and that the virus injected subcutaneously or intramuscularly will stimulate the production of antibodies which will aid in overcoming the infection. In other words, the method is one of active immunization.

Another method consists in treating the patients by means of spinal injections of blood serum derived from persons who have recovered from poliomyelitis. This is based on the assumption that the blood serum of convalescents contains antibodies which will aid in overcoming the infection.

Since it is known that the withdrawal of spinal fluid is in itself frequently followed by a marked improvement of those ill with poliomyelitis, a series of patients has been treated merely by spinal puncture (withdrawing spinal fluid) without any injections. In a number of instances this has been followed by a striking improvement, possibly through the relief of excessive intraspinal pressure.

The physicians in charge of hospital patients are unable to say what value, if any, the foregoing treatments actually possess. It will be only after very careful comparisons between the different series of patients now being treated that any just estimate can be made. Not all of the patients are being injected. Careful records are being kept so that the results obtained in the injected cases can be compared with those in the non-injected cases."

In another column of this issue of the JOURNAL we publish also, in full, the circular of instructions which has been issued by the Department of Health of the City of New York to field workers, regarding procedure for the control of poliomyelitis, to which attention is particularly directed.

## MEDICAL NOTES.

**CHOLERA ABOARD A JAPANESE STEAMER.**—Report from Yokohama on August 3 states that the Japanese steamer *Hacai Maru*, bound from the Orient to Tacoma, Wash., has been indefinitely detained at that port on account of the occurrence of 15 cases of Asiatic cholera, with four fatalities, among steerage passengers.

**PREVALENCE OF MALARIA, MENINGITIS, PELLAGRA, SMALLPOX, AND TYPHOID FEVER.**—The weekly report of the United States Public Health Service for August 4, 1916, states that during the precedent month of June there were reported in Mississippi 12,878 cases of malaria, 1453 of pellagra, 825 of typhoid fever, and 92 of smallpox. In Virginia during the same period, there were 956 cases of malaria, 341 of typhoid, 65 of pellagra, 44 of smallpox, and 31 of cerebrospinal meningitis. There were 180

cases of smallpox in Kansas, and 273 of typhoid in Ohio.

**DECLINE IN DRUG PRICES.**—Report from New York on August 8 states that there has recently been considerable decline in the price of various drugs whose cost had previously been increased on account of the European War.

"Among the articles on which lower prices were established are antipyrine, Russian cantharides, cinchona bark, Newfoundland cod liver oil, glycerine, cream of tartar, epsom salt, Japan wax, mercury in flasks, as well as numerous botanical drugs and essential oils. Among the more important revisions are a sharp decline in glycerine, and a reduction in quicksilver. Quinine meets a fair inquiry and second hands report a firmer market, with the inside price a shade higher. Menthol is firm, but nominally unchanged.

"Opium is quiet and the undertone barely steady at \$10.90 per pound for the gum, in cases. Powdered and granular opium are unchanged at \$12.05 per pound.

"The arrival of 63 cases of quinine from Java, reported 68 cents, appears to be the inside quotation. Manufacturers' quotations are unchanged on the 75 cents basis. Imports of cinchona bark into the United States for the eleven months ending with May amounted to 3,780,540 pounds, as against 3,436,381 pounds for the corresponding period a year ago."

Report from St. John's, Newfoundland, on August 9, states that there has been a sharp decline from the expected price of cod liver oil.

"Newfoundland dealers in cod liver oil fear they must face a loss of about \$1,000,000 as a result of changed conditions in the market this year. Germany last year bought the Norwegian output of this product and the price of Newfoundland oil ran up from 50 cents to \$2.50 a gallon. Expecting big profits this season a large number of persons entered the cod liver oil business in Newfoundland. Their hopes were dashed when the British and French Governments succeeded in obtaining this year's Norwegian output, forcing a 50% cut in market prices. As the dealers bought the raw material at high cost, they must stand a heavy loss."

**HOSPITAL GIFT.**—The Memorial Hospital of the Medical College of Virginia has recently received from citizens of Richmond a gift of \$250,000 to be used for the addition of a nurses' home, a contagious ward, and a new ward for negroes.

**DIPHThERIA IN WATERTOWN, MASS.**—The rapid development of some 25 cases of diphtheria in a congested area in Watertown has necessitated unusual precautions to prevent the dissemination of the disease. A cordon of police has been placed about the infected area, and antitoxin has been administered to every one exposed to the disease.



## EUROPEAN WAR NOTES.

**COMMENDATION FOR AMERICAN AMBULANCE CORPS.**—Report from Paris states that the American Volunteer Motor Ambulance Corps has recently been commended in French General Orders in the following terms:

"General Order No. 135.

"By order of headquarters, the general commanding group D cites the American Volunteer Motor Ambulance Corps, Richard Norton, commanding:

"Because for more than twenty months this ambulance corps has manifested the most complete spirit of devotion to its work and duty. Because it has rendered the very greatest services to the army division to which it is attached in succoring the wounded in the best possible manner. There is not one of its members who is not a model of cool courage and self-sacrifice. Many of them have been wounded.

"The General Commanding Group D.

"Mangin."

**DISTRIBUTION OF RED CROSS RELIEF.**—Report from Washington, D. C., on August 8, states that up to July 1, 1916, the American Red Cross had distributed in Europe, since August 1, 1914, relief supplies to the total value of \$1,327,663, of which \$1,002,022 went to the allied powers, \$310,732 to the central empires, and \$1909 to neutral nations.

"An analysis of the organization's work since the outbreak of the war shows that up to the end of June, supplies worth \$365,594 had been sent to France; \$223,439 to Serbia; \$127,711 to England; \$122,029 to Germany; \$116,561 to Belgium; \$114,410 to Russia; to Turkey; \$8950 to Poland; \$3391 to Bulgaria; \$3092 to Syria; \$2256 to Armenia and \$600 to Mesopotamia.

"Supplies remaining on hand July 1, totaled \$79,047 of which \$25,448 was destined for the central powers; \$12,620 for the allied powers and \$11,766 for other countries, the remainder being undesignated."

## MEXICAN NOTES.

**HEALTH OF AMERICAN TROOPS.**—Dr. Richard P. Strong, of the Harvard Medical School, who recently made a visit of inspection to the encampments of United States troops along the Mexican frontier, has made, in part, the following report to the acting surgeon general, relative to sanitary conditions there observed.

"Reply to your telegram, found sanitary conditions in encampments both of the national guard and regular troops along border and in Mexico, on the whole, in remarkably good condition. In majority conditions excellent and only in a few camps of national guard were there minor details capable of improvement, which, however, were being rectified. In some of the camps of regular troops which have been

occupied in the neighborhood of a year, conditions were excellent. Water supply as being employed in all camps safe. So far as could ascertain, food of good quality and sufficient in amount. Health of troops on the whole excellent, with no prevailing infectious disease. Some of men suffering from effects of exposure to sun, but majority appear to be becoming acclimatized. Sanitation of the various camps is being most efficiently looked after by medical officers of the regular army corps, and if present measures employed are continued in force, there should be no reason to fear epidemics of infectious disease among these troops. Climatic conditions also not favorable for development of epidemic disease in camps at present time. Believe that the regular medical corps deserving of very high praise for the manner in which they are supervising sanitary matters and particularly so because of rapid mobilization of such large number of troops. Think medical corps may become overtaxed, however, and would recommend increase which will certainly be necessary in case of increased demands. Sanitary conditions in Pershing's encampments in Mexico and condition of men excellent."

**MEXICAN RELIEF FUNDS.**—In response to requests from readers we are glad to reprint from the Boston Transcript the following directory of Massachusetts relief funds for troops on the Mexican border and in camp:

*Boston-Metropolitan Chapter, Massachusetts Red Cross*—Eliot Wadsworth, chairman, Miss L. A. Sewell, secretary, 83 Newbury street, Boston. Sends supplies to militia on Mexican border and regulars in Mexico.

*Eighth Massachusetts Regiment Emergency Committee*—Henry Parkman, treasurer, 36 Temple Place, Boston. Collects and forwards essentials.

*Episcopal Chaplains' Fund*—C. C. Payson, treasurer, 18 Post Office Square, Boston. This fund is to purchase comforts to be dispensed by chaplains at Border.

*Essex County Chapter, Massachusetts Red Cross*—Miss Louisa P. Loring, secretary, Pride's Crossing. Sends supplies to militia on Mexican Border and to regulars in Mexico.

*Massachusetts D. A. R. Relief Committee*—Mrs. G. M. Baker, treasurer, Concord. With money collected, this committee makes comforts for militia.

*Massachusetts Red Cross Base Hospitals' Fund*—Allan Forbes, treasurer, 33 State street, Boston. This fund is to provide equipment and maintenance for three Boston base hospitals and 1 hospital columns.

*Massachusetts Volunteer Aid Association*—George C. Lee, treasurer, 50 State street, Boston. A committee working to provide support for families of militia at Border, who are in need.

*Mrs. John A. Pearson Fund*—For purchase of comforts for regular troops in Mexico. Mrs.



J. A. Pearson, treasurer, 29 Melville avenue, Dorchester.

*Ninth Regiment Association*—Joseph H. O'Neil, treasurer, 85 Devonshire street, Boston.  
*Special Aid Society Emergency Fund*—To provide necessities for militia in mobilization camps. Mrs. J. Montgomery Sears, treasurer, 12 Arlington street, Boston.

*Surgical Dressings Committee of the National Civic Federation*—"Home Relief Work" in the preparation of dressings for the Massachusetts Red Cross base hospitals. Old Colony Trust Company, treasurer, 17 Court street, Boston.

#### BOSTON AND NEW ENGLAND.

**MASSACHUSETTS GENERAL HOSPITAL.**—The Massachusetts General Hospital has recently established the practice of sending daily in pleasant weather to Oak Island, Revere, ambulatory patients for open-air sun treatment.

The outbreak of diphtheria among nurses at the Hospital, noted in last week's issue of the JOURNAL, is now at an end. The total number of cases was 38. There were no fatalities.

**DENTAL REGISTRATION.**—It is announced that at the semi-annual examination held last month by the Massachusetts State Board of Registration in Dentistry, 125 candidates passed successfully, including two women.

**CONTROL OF GLANDERS.**—It is reported by Dr. Lester H. Howard, commissioner of the Massachusetts State Department of Animal Industry, that during the past year, since the closing of all public watering-fountains, there has been a diminution of 53% in the number of horses killed in this commonwealth on account of infection with glanders.

**BOSTON BABY HYGIENE ASSOCIATION.**—The recently published monthly report of the Boston Baby Hygiene Association states that during July, 2198 babies were cared for, the largest number yet recorded.

"There were 78 medical conferences held, with a total attendance of 3037, which is the largest monthly conference attendance on record. The average conference attendance for the 12 stations was 39. Three stations, Charlestown, Lincoln House and the Health Unit, had an average attendance of 55 babies. The nurses made 6071 visits on babies registered, and over 1000 visits on eligible and older babies. This is also a record for a single month.

"The 2198 babies cared for averaged over one visit to the physician at a conference, and over two home visits by the nurses. Although 126 more babies were cared for than in July, 1915, 16 fewer babies were referred to physicians or hospitals on account of illness.

"It is announced that the Association tentatively established on August 7 a new milk sta-

tion in the building of the Boston Young Men's Hebrew Association at Grove Hall, Roxbury.

"This new station has been made possible by the contributions of people specially interested in the welfare of the babies of that neighborhood. The station is opened with money enough in hand to conduct it for only three months; but it is the feeling of the Association that, when the results of its work are seen, there will be no difficulty in raising enough funds to make this station a permanent one."

**HOSPITAL REQUESTS.**—The will of the late Mrs. William Wilkins Warren, which was filed in the Boston Probate Court on August 5, contains bequests of \$5000 each to the Brookline Free Hospital for Women, the Perkins Institution for the Blind, and the New England Hospital for Women and Children, and \$2000 to the Children's Hospital, Boston.

#### Miscellany.

#### INSTRUCTIONS TO FIELD WORKERS REGARDING PROCEDURE FOR THE CONTROL OF POLIOMYELITIS.

THE following instructions to field workers in poliomyelitis have been issued by the Department of Health of the City of New York.

##### I. GENERAL INFORMATION.

1. *Incubation Period.*—The incubation period of the disease and the quarantine period applying to children under 16 years of age who have been, but no longer are, exposed to infection, has been placed at 14 days.
2. *Quarantine.*—In all families where a case of poliomyelitis has occurred, all the children under 16 years (except those who have had the disease) are to be quarantined in the home until two weeks after the termination of the case by death, removal or recovery. The patient, whether at home or in hospital, must be quarantined for eight weeks from the onset of the disease.
3. *Placards.*—Every house, without exception, is placarded. On private houses, one placard is placed on the street wall of the house and one placard is placed on the door entering room the patient occupies. On tenements, three placards are used; one for the street wall, one for the wall of the entrance hall and one for the door of the apartment. All placards are dated.
4. *Removal to Hospital.*—No case is to be left at home unless the following conditions are complied with:



- a. There must be a physician in attendance daily and regularly.
- b. The person attending patient must obey quarantine regulations and must not do any housework, marketing or perform any other household duties.
- c. The patient and the attendant must have a separate room.
- d. All the windows of this room must be screened.
- e. The family must have a separate toilet for its exclusive use.
- f. Quarantine regulations must be strictly observed by the patient and the other children of the family, if any. When the disease occurs in the premises or families of food handlers, the employment of such person or persons at this occupation is forbidden, unless they occupy entirely separate apartments, for a period of two weeks after the removal, recovery or death of the patient.
- g. *Disinfection and Renovation.*—The personal and bed linen of the patient must be properly disinfected and, after removal, recovery or death of the patient, complete renovation of the premises is done.

## II. DUTIES OF INSPECTORS.

Cases are reported by physicians', nurses', social workers' and citizens' complaints, and all are visited at once by inspectors, even those reported by physicians with request that they be admitted to hospital.

The janitor or his representative must be seen in every instance and notified that he will be held personally responsible by the Department for keeping quarantined children in the family premises, and seeing that placards are not removed.

If the inspector makes or confirms the diagnosis, the Borough Office of the Department is notified and by it the ambulance is summoned, if removal is indicated. The average time required from the time of report until the time of admission to hospital, is now about eight hours. In every case the inspector leaves a hospital admission slip properly and fully filled out.

All cases of questionable diagnosis are seen at once in consultation with the Borough or Chief Diagnostician and whenever it is required, spinal puncture is made and laboratory report submitted by the staff of the Research Laboratory. A full history is recorded on a special card (Form 316-V) for each assignment covered by inspectors.

## III. DUTIES OF NURSES.

Nurses at once visit every case so reported, to instruct the family regarding quarantine, and every other family in the house:

- a. that a case of this disease is in the house;
- b. that the other children of the family in which the disease has occurred will be quarantined, but that, should they fail to observe quarantine, that fact will be immediately reported to the Department of Health and steps taken to enforce quarantine by a summons to Court, if necessary;
- c. regarding home cleanliness, personal hygiene, the danger of infection by flies and any general measures which may be taken to prevent infection;
- d. to report at once to the Branch Office any suspicious illness of children or any cases of poliomyelitis, especially if they are not under the care of a physician.

Nurses must see the janitor or his representative on first visit, and repeat the instructions given by the inspector.

Patients remaining at home are visited at least twice weekly for the maintenance of quarantine, and oftener if necessary. After removal, recovery or death of the patient, nurses issue renovation notices, following these up by visits until complied with.

## IV. DUTIES OF THE SANITARY POLICE.

These officers visit frequently, daily if necessary, premises in which patients have been allowed to remain, to enforce quarantine and to affix or replace placards. They serve the summonses when quarantine regulations are broken, and appear in court.

## V. ALLIED SOCIAL, NURSING AND LAY WORKERS.

Under the direction of the Department of Health, nurses supplied by the Charity Organization Society, the Association for Improving the Condition of the Poor, the United Hebrew Charities and Henry Street Settlement, and lay visitors from various social service organizations, are engaged in an intensive house to house, family to family survey in infected districts, to verbally instruct them regarding the disease and its prevention by personal and domestic hygiene and to report illness, especially of children, and insanitary conditions.

The Metropolitan, Prudential and John Hancock Insurance Companies are distributing literature by their visitors who will also report illness and insanitary conditions.

## VI. ROCKEFELLER FOUNDATION.

Physicians and nurses supplied by the Rockefeller Foundation, under the direction of the Department of Health, follow up the ramification of all reported cases of poliomyelitis, and also doctors to cause inspection, and report suspected cases.



## Correspondence.

## A GENERAL PRACTITIONER'S OPINION.

*Mr. Editor: Hoccus, stans in tecto domus, lupo practerenti maledixit. Cui lupo, "Non tu," inquit, "sed tectum mihi maledixit."*

Not Dr. Richard Cabot, but his exalted position, reviles us. The numerous *non sequiturs* in the lay articles of Dr. Cabot recall many memories of the days of my youth when I was a junior master in a large public school. Quite boyish is his account of how the mercenary surgeon was balked of his prey. "Under my treatment she recovered." When asked how soon the surgeon should be called upon in a case of gastric or duodenal ulcer, Dr. W. J. Mayo was accustomed to reply, "After the patient has had nine medical cures."

The story of the hide-bound medical truth-teller, as told in the July *Harvard Theological Review*, seems to have been excessively abridged. I first heard this story over two years ago. In making this shocking and false diagnosis of tuberculosis, and in announcing it to the patient, the able and experienced, the honorable and honored general practitioner who had been in charge of the case was wholly ignored. But, at once, on the same day, as soon as the general practitioner heard of it, he stated that, though he did not know exactly what the matter was, he did know one thing, that it was not tuberculosis.

Not very many years ago a surgical friend of mine had a sponge left in his abdomen by a surgical friend of his. The mistake was discovered a few weeks later. I do not know whether "there was much good-natured chuckling," or whether the victim "readily forgave the mistake." As between mental and physical suffering, I much prefer the physical. I have had above average personal experience of both.

A few weeks ago the *Transcript* had an editorial headed, "Dr. Cabot and the Other Doctors." And that is about the alignment. I am very sure that Dr. Cabot wholly misrepresents all save a very small and negligible fraction of the doctors. Dr. Cabot "is a man of faith, who has surrendered his reason, and whose unbounded vanity always makes him see things with prejudiced eyes." "He has lost the faculty of impartial judgment." "He never keeps his mind open, and is not an earnest inquirer of truth." "He is satisfied with what poor fragments of philosophical patchwork he has got, and to him that is the whole truth." Thus equipped, he dashes off articles and addresses, with misinterpreted and distorted facts, with innuendos, insinuations and slanders. He is as ignorant of the work and problems of the general practitioner as though he lived in China or Thibet. He can have but the most elementary conception of the bodily changes due to emotions. I doubt whether he has even a superficial acquaintance with the splendid work being done by the Metropolitan Life Insurance Company on Community Morbidity and kindred subjects. Nevertheless, "priding himself on the possession of the art of critical research, he misuses the inductive process and generalizes too widely and emphatically on very sparse facts and cunningly puts his conclusions before the world without any sense of shame."

FRANK E. BATEMAN, M.D.  
Somerville, Mass., August 9, 1916.

## SOCIETY NOTICES.

AMERICAN ASSOCIATION FOR STUDY AND PREVENTION OF INFANT MORTALITY.—The Seventh Annual Meeting of the American Association for Study and Prevention of Infant Mortality will be held in Milwaukee, October 19-21, 1916.

The subjects to be discussed include:

Governmental activities—Federal, State and Municipal—in relation to infant welfare.

Care available for mothers and babies in rural communities.

Standards for infant welfare nursing.

Morbidity and mortality in infancy from measles and pertussis.

Public school education for the prevention of infant mortality.

Vital and Social Statistics.

Dr. S. McC. Hamill, of Philadelphia, is president of the Association, and Dr. Wm. C. Woodward, of Washington, president-elect for 1917. Dr. George C. Ruhland, Health Commissioner, Milwaukee, is chairman of the Committee on Local Arrangements.

The sessions will be under the chairmanship of the following:

Obstetrics—Dr. A. B. Emmons, 2d, Boston.

Propaganda—Dr. George R. Bedinger, Detroit.

Pediatrics—Dr. Borden Veeder, St. Louis.

Governmental Activities and Vital and Social Statistics—Dr. Wm. C. Woodward, Washington.

Public School Education for the Prevention of Infant Mortality—Prof. Abby L. Mariatt, Madison.

Rural Communities and Nursing and Social Work—Dr. Dorothy Reed Mendenhall, Madison.

The session on Pediatrics will be a joint one with the Milwaukee County Medical Society. The session on Governmental Activities will be a joint one with the Committee on Vital and Social Statistics, and the session on Rural Communities will be a joint one with the Committee on Nursing and Social Work.

Programs or other information in regard to the meeting can be secured from the Executive Secretary, 1211 Cathedral Street, Baltimore, Maryland.

MISSOURI VALLEY MEDICAL SOCIETY.—The annual meeting of the Medical Society of the Missouri Valley, under the presidency of Dr. John P. Lord, will be held in Omaha, at the Hotel Fontenelle, on Sept. 21 and 22, and the arrangements are being made by a committee under the auspices of the Omaha-Douglas County Medical Society. Invitations have been sent to a number of men of national prominence, as well as to the presidents of all the State Medical Societies within our province. The program will be limited to twenty papers, thus affording more time for discussion. A cordial invitation is extended to the physicians of nearby states.—CHARLES WOOD FASSETT, Secretary.

## APPOINTMENT.

DR. FRANKLIN C. McLEAN, of the Rockefeller Institute, has been appointed professor of internal medicine at the Union Medical College, Peking, China.

## RECENT DEATHS.

DR. JAMES H. WHEELER, 71, of 124 North Street, one of the oldest physicians in the city, died last week, on July 25, in Pittsfield, after a brief illness. Dr. Wheeler was born in Lowville, N. Y., coming to Pittsfield shortly after graduation from the Detroit Homeopathic Medical College in 1873. He leaves two sons, Dr. Ralph D. Wheeler of Pittsfield, and Dr. Roy M. Wheeler of Springfield, one brother, John Wheeler of Pueblo, Col., and a sister, Mrs. Jane Reese of Watertown, N. Y.

DR. ROWLAND COX, JR., of 287 Broadway, Paterson, N. J., who was for seven years instructor in operative surgery in the College of Physicians and Surgeons, New York, died on Aug. 2 in the New York Hospital, in his forty-fifth year. He was connected with the Paterson General Hospital and was a member of the City, County and State Medical Societies of New York. He leaves his son, mother and two brothers.



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## Massachusetts Medical Society.

### PAPERS READ BEFORE THE SECTION OF TUBERCULOSIS, WITH THE DISCUSSION, JUNE 6, 1916.

#### CONTACT POINTS BETWEEN PULMONARY TUBERCULOSIS AND SYPHILIS.

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IN searching through the voluminous literature on the subject of pulmonary syphilis, one is amazed and bewildered by the diversity of opinions held by the medical profession on this important and, to me in the light of my experience, unusual and uncommon condition. It has been frequently suggested to me that a large percentage of the cases at Rutland would be found to possess definite pulmonary syphilitic lesions, were a careful and diligent search instituted. To test this supposition 471 of our patients have been subjected to the Wassermann test. The results of these tests, together with a study of their clinical significance, form a part of this paper.

The credit for the first anatomical description of pulmonary syphilis must be given to Depaul who, in 1853, read before the Paris Academy a paper entitled "A Manifestation of Congenital Syphilis, Consisting in an Alteration of the Lungs Not Yet Described." Virchow was inclined to express himself with considerable reserve as to

the disease and was doubtful as to most of the cases that had been previously reported. He mentions having observed certain lesions of the lungs which he considered syphilitic, particularly so if there were other manifestations of syphilis elsewhere in the body. The most marked lesions that he found were a fibrous interstitial pneumonia along the bronchi, leading to the formation of fibrous bands passing from the centre of the lung along the bronchi and vessels toward the periphery, thus forming by their contraction more or less deformity of the lung. Along with this condition he believed that in certain cases there was an associated pleurisy, later on forming fibrous nodules beneath the pleura. He states that caseous pneumonia and gummata might also be discovered, and describes cavities formed from the breaking down of foci of caseous pneumonia, thus bringing up the question of syphilitic phthisis. All subsequent descriptions of the disease are based on this work of Virchow.

Carlier, in 1882, collected 75 cases from different sources, and of these he reported the autopsy findings in 50. Hiller, in 1884, collected 87 cases, 84 of which were examined post mortem. Of these Carlier had previously reported 20. Hiller himself reported two cases in which syphilis of the lungs was undoubtedly present, there being also other evidences of syphilis. He is positive in his denial of the existence of syphilitic phthisis and fibrous interstitial pneumonia found in the cases reported by Carlier and Hiller. He considered these lesions as the result of the infection of the lungs by the bacillus of tuberculosis, and considered the description of these lesions as "syphilitic" of "probable" origin.



\* the 84 cases of Hiller with autopsies should be considered as syphilitic, the doubtful cases in all likelihood being pulmonary tuberculosis with fibrosis.

All authorities, with almost the single exception of Paneritius, agree that pulmonary syphilis is rare. Most of the cases that he reported are clinical and consist of rather indefinite pulmonary lesions, with frequently obscure general manifestations of syphilis which responded to iodide of potassium. From the report of the autopsies which he gives it would appear that most of his cases were also ones of tuberculosis.

West maintains that out of 6000 syphilitic patients treated at the hospital in Copenhagen during a period of seven years, only 2 furnished clinical evidence of pulmonary syphilis. He also states that of 18 autopsies of adults who died of acquired syphilis, specific disease of the lungs was found in but three instances. Out of 105 autopsies on children with congenital syphilis the lungs were affected in but four instances. Lenhartz states that his teacher, E. Wagner, could recall but one instance in which he could make a clinical diagnosis of pulmonary syphilis, and in which a cure followed anti-luetic treatment.

Fowler maintains that pulmonary syphilis is a rare disease, and bases his statement on the fact that he was able to find only 12 specimens in the museum of the London hospital of the Royal College of Surgeons. He contends that two of these may be excluded as either not of that nature, or of a character so doubtful that they are inadmissible as evidence. None of these specimens is from a case of congenital syphilis.

Councilman, who reports two cases with autopsy, states that the essential process in the production of a gumma in the lung is a pneumonia with fibrinous exudation, accompanied by a fibrous change in the alveolar wall, the whole subsequently undergoing caseation. A hyaline degeneration of the capillaries of the affected area is stated to be the first step in the process; this is followed by atrophy of the alveolar wall. The alveoli become distended with large pale epithelial cells and fibrin; the cells also undergo hyaline degeneration, forming smooth bodies staining with eosin and varying in size from one-half the diameter of a red blood corpuscle up to that of a large epithelial cell. The capillaries become converted into rigid tubes and their lumen is much narrowed. Similar changes occur in the small veins and arteries. Immediately around the bronchi and arteries there is a formation of connective tissue, and here the alveolar walls show much thickening and contain small round cells. The whole of the structure thus altered tends to undergo necrosis, and when that change is complete a caseous-looking mass results.

Of cases of acquired syphilis of the lungs there are two varieties. In one there are gummata which vary considerably in size and frequency. They may range from one eighth of an

inch to several inches in diameter, and there may be one or several of such masses scattered throughout the lung. In their incipient stage they are elastic and of a whitish or reddish-white color. At a later period they may undergo caseation and soften, or even become of firmer consistency. Accordingly gummata appear so like tuberculous masses that to differentiate them is a difficult problem. They are located in the interstitial connective tissue surrounded by a dense fibrous capsule. It is maintained by some that these gummata may soften and break into a bronchus and thus be discharged, thereby developing a cavity. Osler believes that when such a condition does occur it is caused by the action of tubercle bacilli. Usually these gummata are converted into dry, firm, cheesy masses, or else they undergo transformation into interstitial tissue. In the post-mortem examination of patients dying in the tertiary stage of syphilis stenosis of the small and large bronchi has been found, due to cicatricial contraction. These gummata may undergo fibrous changes, their resulting cicatricial contraction producing stenosis of the bronchi which, if complete, causes atelectasis of the air cells supplied by the stenosed bronchus, while a bronchiectasis may develop on the tracheal side of the stenosis.

The interstitial hyperplasia appears to have no characteristics which would in any way distinguish it from fibrosis due to tuberculosis, except in that it seems to have a tendency to be confined to one lung. This fact has been brought out very clearly by radiographs shown to me a few days ago by Dr. Holmes at the Massachusetts General Hospital. These were proven cases of syphilis, and the diagnosis of syphilis of the lungs was suspected. In one instance there was a marked destructive condition of the whole of the left lung with no apparent involvement of the other, a condition which would not be apt to occur in a given case of pulmonary tuberculosis, because of the improbability of the opposite lung escaping infection. In another case there were two well defined areas, one occupying the upper portion of the left lung, and the other located in its lower portion. These areas were clean cut and the rest of the lung was not affected, nor were there any evident lesions in the right lung. One would hardly expect to find such a condition existing in pulmonary tuberculosis.

The clinical picture produced by syphilitic disease in the lungs is rather indefinite and depends to a great degree upon the extent of the disease process. It is doubtful if a single gumma would produce symptoms unless it should be of sufficient size, or located in such a position as to cause pressure on important blood-vessels, or large bronchi. Likewise, the presence of interstitial changes at the root, or in the interior of the lung, is hardly likely to produce symptoms unless it is sufficiently extensive to interfere with the respiratory capacity.

There is a class of cases, however, in which



the clinical picture of chronic phthisis is observed, and these are described by some authors as pulmonary syphilis. They occur in patients who present evidence of tertiary lues, or have been infected from 5 to 15 or 20 years previously. Whether the symptoms produced in such cases, however, are really due to syphilis is a much-disputed question, and one that has not so far been settled.

It is safe to state that the symptoms referable to pulmonary syphilis are not as a whole alike in every case, nor are they sufficiently characteristic as a group to make positive the diagnosis of syphilitic disease of the lungs, as differentiated from other pulmonary diseases. Indeed there are no symptoms distinctive of pulmonary syphilis.

In regard to syphilitic lesions of the bronchi, it seems of importance to bring out the fact that the signs of bronchitis which are found in the second stage are, as a rule, general in their distribution; while in the tertiary stage they are usually localized, owing to the tendency at that period to form interstitial changes or gummata in the bronchi. If stenosis occurs there may at first be bronchial breathing limited in area, and this may be found most frequently about the root of the lung posteriorly. As the capacity of the bronchi becomes narrowed, the respiratory murmur over the pulmonary area which it supplies becomes more and more altered until finally it disappears when the air ceases to pass the stenosis. If bronchiectasis occurs it will be followed by cough with profuse purulent and often foetid expectoration, and it is also accompanied by general constitutional disturbances, such as loss of weight and elevation of temperature.

Cough seems to be one of the earliest and most prominent symptoms in the cases reported in the literature on the subject. At first it is laryngeal, then it becomes tracheal or bronchial. Dyspnoea would appear to come next in point of frequency, and varies in severity according to the degree of the lesion. It may be mild when the process is slight, or very severe when marked fibrosis or stenosis of one of the main bronchi is present. The dyspnoea tends to become paroxysmal and to assume the character of bronchial asthma. Hemoptysis is not of frequent occurrence, but it may occur and prove fatal. Expectoration may be profuse, purulent, greenish or yellowish in color and offensive. It may also be streaked with blood. Foul expectoration is common in cases of advanced pulmonary syphilis. Pain may be present, but it is not so prominent a feature as in pulmonary tuberculosis. It is usually due to a syphilitic perihepatitis and not to pleural inflammation. Emaciation is not, as a rule, nearly so extreme and rapid as in tuberculosis, but with advanced lesions in the lungs the difference is not so remarkable as to be of any value from a diagnostic point of view. Night sweats may occur. Pyrexia may be present to a greater or less degree, depending upon the extensiveness of the pulmonary lesions. There may be a complete

absence of fever in the early stages of the disease, and on the other hand it may assume the hectic type, as in tuberculosis, if the process is extensive.

The lesions of pulmonary syphilis are rarely of such a nature as to produce physical signs by which they can be distinguished from other pulmonary diseases of an entirely different origin. On inspection there is likely to be an altered appearance of the chest, depending upon the extent and location of the fibrosis, but it will hardly present the retraction of the apices so frequently seen in tuberculosis. If there are extensive changes in the lungs their expansion will be diminished, and there may be unilateral retraction like that seen in cases of fibrosis from other causes. Areas of consolidation and cavities will be recognized by the ordinary signs, probably long before syphilis is suspected.

A careful inquiry should be made into all cases of pulmonary disease as to the possibility of a latent syphilitic infection. It has been my experience in the routine taking of histories that almost invariably a patient will deny that he has ever had lues, and in many instances they are perfectly honest in their statement, because they have not known of the nature of their disease. At Rutland I am able to obtain a definite syphilitic history in many instances only after the patient has been notified of the result of the Wassermann test.

Careful search should be made for syphilitic lesions in the calvarium, the sternum, ribs, testes, larynx, liver and spleen, and if there is a suspicion of syphilis the search should not be abandoned in a case of pulmonary disease with a positive, or even a negative, Wassermann without first having a careful radiograph taken of the lungs and the long bones.

In pulmonary tuberculosis the apices of the lungs are the parts most frequently affected, and the disease has a tendency to spread downward over a definite line of march. One lung is rarely found extensively diseased without an involvement of the other. The lesions of syphilis on the other hand seem to localize themselves about the root, base, and central portions of the lung, and they are, as a rule, confined to one lung, even when there is a marked destruction of tissue. Careful study of undoubted specimens of pulmonary syphilis, however, does not bear out the statement frequently made that the lesions are generally limited to the middle portion of the lung. They are so often found elsewhere that their more frequent occurrence in that part ceases to be a factor in diagnosis.

The presence of cavity signs in the lung and the expectoration of large amounts of serum persistently negative to tubercle bacilli should always suggest pulmonary syphilis. In these cases and in all other doubtful ones a very careful examination should be made by a competent roentgenologist who has had considerable experience in the taking and interpretation of chest films. The Wassermann should also be made, and the



given to every case presenting a pulmonary disease, and a negative finding after repeated tests should not necessarily be considered as evidence to exclude the possibility of a syphilitic origin. In all cases of pulmonary tuberculosis, which are at all doubtful, when the sputum is persistently negative, the subcutaneous administration of Koch's Old Tuberculin should be given in doses and periods laid down for that test. If the tuberculin reaction is negative, and there is a marked Wassermann reaction, and if the x-ray examination of the chest is confirmatory or suggestive, if lesions are found in the bones and there are other manifestations of syphilis present, a diagnosis of pulmonary syphilis would seem probable. On the other hand, if a positive reaction to tuberculin occurs in a given case of pulmonary disease with a marked positive Wassermann, it will be difficult indeed to make a correct diagnosis because the two diseases, pulmonary tuberculosis and syphilis, may co-exist while the x-ray examination may not be of assistance.

It has been suggested by some writers on this subject that if a pulmonary disease which has not responded to ordinary non-specific treatment were put on an anti-luetic treatment, and the process thereupon improved or disappeared, one would be justified in maintaining that the case was syphilitic. It will be noted that in the cases Numbers 1 and 2, here reported, the physical signs in the chest and the general condition showed striking improvement under nothing but the usual sanatorium treatment. Both of these patients had definite signs in the chest, and symptoms pointing to tuberculosis. An x-ray examination made in one of the cases showed an apical lesion. They had a positive and a doubtful Wassermann respectively and negative sputum. On the administration of 1 mgm. of Koch's Old Tuberculin they failed to react, as they did also to 3, 5 and 10 mgms. respectively. Both of these patients were referred to us from large hospitals. They had been examined repeatedly and considered to be tuberculous. During their stay in the sanatorium they have increased greatly in weight, and the physical signs have entirely disappeared. Had these patients been put on anti-luetic treatment and the same result had occurred, we are confident that we should have been disposed to credit the improvement to the therapeutic effect of the drugs. On the other hand, even in a given case of pulmonary syphilis where marked changes in the structure of the lung have taken place, with cavity formation, strictures of the bronchi, etc., one would not expect specific treatment to improve these conditions.

In still another instance (Case 3), where there were marked physical signs in the chest with a negative sputum on repeated examination and a positive Wassermann, the patient was put on specific treatment, mercurial inunctions and potassium iodide, and within a very few weeks the process in his chest became more active. He

began to cough and expectorate large amounts of muco-purulent sputum which contained tubercle bacilli. The x-ray diagnosis in this case was pulmonary tuberculosis, involving the upper two-thirds of the left lung and the apex of the right.

Case 4 had well defined lesions in both lungs. His sputum was positive on admission, but was negative thereafter on repeated examinations. It was only a short time before his discharge that his blood was examined and found to be positive to the Wassermann reaction. This patient gained 26 pounds in weight during his residence, and at the time of his discharge his pulmonary disease was "apparently arrested." The x-ray report is as follows: "Dilated arch with dense mottled areas in both apices." If this patient had been given specific treatment and had made a similar improvement we might have considered that this was an instance of an associated pulmonary tuberculosis and syphilis.

CASE 1. Admitted January, 1916. Female, housewife. Age 28. Married. Family history, negative. Well as a child, with the exception of having had children's diseases. Menses established at 15, but have always been irregular. Was married ten years ago, and has a healthy, living child, aged 9 years. She has had no miscarriages. She gave a negative history to syphilis prior to the positive findings of her Wassermann test, but following this she stated that she had an eruption on her skin shortly following the birth of her child. She had no treatment for this condition. During the past several years she has had pain in her back, suffered occasional chills, gradual loss of strength, anorexia, constipation, and during the past few months has lost about 12 pounds in weight. There has been no cough or expectoration.

In December, 1915, she was treated at one of the hospitals in Boston, and a diagnosis of incipient tuberculosis was made and confirmed by the x-ray examination. The process at that time, so she was told, was in the right apex. Later she was examined at another hospital, and was advised to go to Rutland for treatment. Her application blank was marked "incipient."

On admission she complained of loss of strength, constipation, slight morning expectoration and pain in the back. Her temperature was 99° F. and her pulse was 102.

*Physical Examination.*—Fairly well developed; fairly well nourished; attitude erect; color of lips and mucous membrane normal; teeth in good condition; pupils equal and react. Nares, pharynx and larynx normal. There are several large and small scars about the shoulders and back, which are stated to have been caused by being scalded by hot water. There is no enlargement of the lymph nodes. The chest mobility and symmetry are normal. Heart normal. On percussion there is slight dullness in the right apex anteriorly extending down to the second rib, and posteriorly extending down to the fourth vertebra. Over this area there is bronchovesicular breathing, and there are a few medium râles; the left apex is a little high pitched on percussion, and there are a few fine râles present.

The temperature throughout her stay ranged from 97 to 99° F.; her pulse has varied from 70 to 105, with a steady gain in weight and strength. The



physical signs have gradually disappeared from her chest, and her sputum has been on repeated examinations negative to tubercle bacilli. On March 14, 1916, following the routine examination of patient's blood, she was found to have a positive Wassermann. Consequently, beginning on May 16, 1916, she was given 1, 3, 5 and 10 mgms. respectively of Koch's Old Tuberculin subcutaneously, and there was not the slightest local, focal, or general reaction. This was apparently not a case of pulmonary tuberculosis, and she was discharged with instructions to take specific treatment, having gained 15 pounds in weight.

**CASE 2.** Admitted Feb. 11, 1916. Female. Housewife. Age 25. Married. Mother and father well. An only brother died of pulmonary tuberculosis two years previously. She was delicate as a child, having had pneumonia at the age of three months, diphtheria in childhood, measles, etc. Menses established at 14, irregular. Was married six years ago, and has two children living and well. She had an induced miscarriage two years ago, and has not been well since that time. She gave a negative history to syphilis on admission. During the past two years she has complained of a moderate cough and expectoration, together with pleural pains. She has been suffering from moderate dyspnea, and in May, 1915, she expectorated about a drachm of clear blood. The same thing occurred in January, 1916, but the blood then expectorated amounted to about one ounce. There has been a gradual loss of strength during the past two years. Her usual weight is 110 pounds, but on admission she weighed only 104 pounds.

She had been treated by various physicians, during February, 1916, an application was made for her admission to the State Sanatorium by her physician, who stated that she was between the incipient and moderately advanced stages of her disease. The duration was stated to be two years, and the process was marked as being in the right apex anteriorly.

Her symptoms on admission consisted of moderate cough, moderate loss of strength, insomnia and moderate dyspnea.

**Physical Examination.**—Poorly developed and poorly nourished; attitude erect; color of lips pale; teeth fair; pupils equal and react. Lymph nodes negative. Nares, pharynx and larynx negative. Mobility and symmetry of the chest normal. Heart normal.

There is slight dulness in the right apex anteriorly, extending down to the third rib, and posteriorly extending down to the fourth vertebra; high pitched breath sounds and medium coarse râles are present over all this area.

During her residence her temperature fluctuated between 97.4° F. a.m., and 99.2° F. p.m., and her pulse varied between 70 a.m. and 106 p.m. She gained 10 pounds in weight. Her symptoms have all disappeared, and she is stronger and the physical signs in her chest are now negative.

She had a doubtful Wassermann on two examinations. Her sputum was negative to tubercle bacilli on repeated and careful examinations. On May 16, 1916, she was given 1 mgm. of Koch's Old Tuberculin subcutaneously, which failed to cause a reaction, and consequently she was given 3, 5 and 10 mgms. respectively, following which there was still no reaction. She was therefore discharged as

non-tubercular, with the recommendation that she take specific treatment.

**CASE 3.** Admitted October, 1913. Male. Age 20. Cook. Single. Family history, negative. As a child was delicate, and had the usual diseases of childhood. He denied having had syphilis. His present illness began in March, 1913, at which time he claims to have had a "touch of pneumonia." Since then he has been losing weight, has had a moderate cough and expectoration. He has had a slight evening temperature, night sweats and moderate loss of strength. On admission the foregoing symptoms were still present.

**Physical Examination.**—Fairly well developed and nourished; attitude erect; color of lips and mucous membrane normal; teeth in good condition; pupils equal and react; lymph nodes negative. The ears, nares and pharynx are normal. There is a slight thickening of both vocal cords, with moderate inflammation and catarrh. Mobility and symmetry of thorax normal. Heart normal. There are no scars of any kind upon the body. There is a slight, incipient lesion in the right apex, with dulness in the left lung, extending down to the third rib anteriorly, and to the sixth vertebra posteriorly, in which area there are numerous râles, and also harsh breathing.

During the first few months of his residence he ran a rather irregular temperature and pulse. His sputum was persistently negative to tubercle bacilli. On Aug. 18, 1915, his Wassermann was positive, and on questioning him he admitted that he had had a primary lesion in 1912. He took "pills" for several months, and there were no secondary manifestations of the disease. Iodide of potassium was given, together with injections of mercury. Because of the "two-year residence rule," he was discharged as a patient in September, 1915, as "improved," and took up employment in this institution. Some time later he began to lose weight, his cough increased and he raised large amounts of muco-purulent sputum, which contained tubercle bacilli. The physical signs in his chest increased, and his temperature, which had been normal for several months, became elevated. The x-ray diagnosis was tuberculosis of the upper two-thirds of the left and the apex of the right lung.

**CASE 4.** Admitted June, 1915. Male. Age 37. Printer. Married five years, no children. Family history negative. As a child was well, with the exception of diseases of childhood. He denied having had syphilis. His present illness dated from about one year back, at which time he began to feel run down. In January, 1915, he coughed and expectorated moderately, and later he complained of dyspnea, chills, moderate fever, night sweats, etc. On admission he had practically no cough or expectoration, and none of the above symptoms were present.

**Physical Examination.**—General development fair; well nourished; attitude erect; color of lips and mucous membrane normal; teeth, artificial, good; pupils, lower ones in good condition. Mobility and symmetry of thorax normal. Heart normal. There are interstitial changes in the right lung, involving the upper and middle lobes anteriorly, and the upper lobe and apical portion posteriorly. There are scattered deposits in the apex of the left lung, and of the activity. Whole chest is free from râles.



cally normal temperature and pulse, and his sputum, although it was examined repeatedly, was found to contain tubercle bacilli only once during his residence.

On Oct. 2, 1915, his Wassermann was found positive, and he then informed us that he had had an initial lesion in 1900, for which he took mercurial pills for about one month. In March, 1916, an x-ray examination showed dense mottled areas in both apices. Diagnosis, pulmonary tuberculosis. He was discharged in March, 1916, having gained 26 pounds in weight, and the physical signs in his chest had entirely cleared up, there being nothing present but a few fibroid changes in the tops of both lungs.

Of the 471 cases having received the Wassermann test, 430 were negative, 10 were doubtful, 2 were unsatisfactory, and 29, or 6%, were positive. Of the 430 negative cases 140 had incipient pulmonary tuberculosis, 105 of these had repeated negative sputum, and 35 had positive sputum. Moderately advanced, 222, and of these 75 had negative sputum, and there were 149 instances where it was positive. The remaining 68 were far advanced; and of these 7 were negative, and 61 had positive sputum. The sputum was negative in 4, and positive in 2 of the doubtful cases in the incipient stage; 2 had negative and 2 had positive sputum in the moderately advanced stage. There were no doubtful cases in the far advanced stage of their pulmonary disease. Of the 2 unsatisfactory cases, both of which were in the moderately advanced stage, one had a positive sputum and the other was negative.

A positive Wassermann was obtained in 10 incipient cases, and of these cases 8 had negative sputum and 2 positive sputum. In the moderately advanced stage, 4 had negative and 11 positive sputum. In the far advanced stage there were only 4 that gave a positive Wassermann, and in each instance the sputum was positive.

From my experience at Rutland, and the careful consideration of the cases there, I am firmly convinced that all patients who are suffering from diseases of the lungs should be given repeated Wassermann tests. It is by this method, together with a careful study of the x-ray findings and physical signs in these organs, that we may hope to settle this difficult and complex question of what really constitutes clinical pulmonary syphilis.

#### DISCUSSION.

Dr. W. A. Hinton, Cambridge: I am much pleased with the points Dr. Lyon brought out in his paper, especially the description which he gave of the pathology of the disease. In a review of more than 5,000 autopsies, I do not recall a single case where the diagnosis of syphilis of the lungs was made in an adult. There is a good deal of work to be done on the disease, and we cannot be absolutely certain that lesions

of the lungs which we think are syphilitic are such until spirochetes are found.

In regard to the incidence of syphilis among the tuberculous, out of 1164 cases examined by the State Wassermann Laboratory from patients in the Boston Consumptives' Hospital and in Rutland, 105, or 9%, gave positive reactions; 49, or 4.5%, doubtful reactions. These Wassermann tests were done as a routine in these two institutions. It is of interest to compare these statistics with others. In the case of the Lying-in Hospital, in 1130 cases about 5.9% were positive and an equal per cent. were doubtful. It would seem to indicate that roughly from 5 to 7% of the inhabitants of Massachusetts are syphilitic. I take the statistics of the Boston Lying-in Hospital as giving the average, as these people apply for a specific complaint—pregnancy—and no diseased condition. On the other hand, in general hospitals, about 20% of all patients give a positive Wassermann.

As bearing upon the relative frequency of a negative or positive sputum in the cases with a positive Wassermann test, the following statistics will give some information: In the Boston Consumptives' Hospital and Rutland State Sanatorium in 67 positive Wassermans, 35 had a positive sputum and 32 had a negative. In 707 negative Wassermans, 364 had a positive sputum and 343 had a negative. In other words, there is no more likelihood of finding a positive Wassermann in cases with a negative sputum than in cases with a positive sputum.

In conclusion, I wish to emphasize Dr. Lyon's point to the extent of saying that I believe that all patients, whether private or institutional, who have a diagnosis suggestive of pulmonary involvement, should have a Wassermann test performed.

DR. C. MORTON SMITH, Boston: This subject was first brought to my attention about twelve or fifteen years ago, when a patient of mine, definitely luetic, who had been under treatment for a matter of three or four years, fell overboard down the Harbor one day in June. The wetting and exposure were followed by an attack of pleurisy, according to his description. Two or three months later he applied at one of the hospitals for a chest examination, and was recommended to a State sanatorium as a case of incipient tuberculosis. He remained at the institution about ten months, and during that entire period had a persistently negative sputum. It was before the days of the Wassermann test. The guinea-pig inoculated with his sputum in December was killed the following June, and, at the post mortem, showed no evidence of tuberculosis.

As far as diagnostic signs on physical examination are concerned, it seems impossible to distinguish, from physical examination alone, a case of syphilis of the lung from tuberculosis,



judging from the cases that have proven to be definitely syphilitic; for practically all these cases have either been recommended to, or have spent a certain time in, one of the State sanatoria, having been sent there by experts. It seems to me that the x-ray furnishes one of the most valuable aids in the matter of diagnosis. The distinctions have been brought out by the reader, and I will not dwell on them.

Another point the reader mentioned is the well being of the individual with syphilis of the lung, as compared with the same degree of pulmonary involvement of tuberculosis. It seems to me that, in the matter of syphilis of the lung, the Wassermann is of about the same value as it is in other questions of syphilitic involvement. It is not so much a test as an additional symptom or sign of the disease. When we realize that the Wassermann reaction is positive in a large percentage of cases of leprosy, sleeping sickness, and certain other conditions, we see that it is far from a specific test. There are other temporary conditions in which the reaction is positive, such as certain febrile conditions, malaria at the time of the chill, pneumonia, scarlet fever, and sometimes after ether anesthesia. This winter at the Massachusetts General Hospital there were several cases of broncho-pneumonia that gave a varying degree of positive result, the reaction becoming negative, with no anti-syphilitic treatment, when the fever subsided. Probably other conditions, unknown at the present time, may give a temporary positive reaction.

There is one point not mentioned which I think is of value, and that is the need of performing the Wassermann test on other members of the family—the husband or wife, as the case may be. In cases where the patient fails to give a positive reaction, the mate may give a positive reaction in a fairly definite percentage. The same is true of examination of their children.

The x-ray plates, which Dr. Lyon speaks of as having been shown him by Dr. Holmes, were undoubtedly from one of our cases of congenital syphilis, where one lung is practically consolidated, while the other shows no evidence of involvement.

The persistent negative examination of sputum for tubercle bacilli is another striking point in this condition.

Dr. Hinton has probably given the correct solution of the failure of the pathologist to recognize this condition in the lung macroscopically. In the same way definite specific lesions of long bones are revealed by the x-ray alone.

In the matter of tuberculin tests, Dr. Otis published some cases several years ago where he did the tuberculin test on a certain number of definitely knownluetics, with no signs of tuberculosis. As I remember it, he obtained about 33 1/3% of positive reactions in syphilis. That is interesting in connection with Dr. Lyon's

observations that syphilis fails to give a positive reaction, even in large doses of the old tuberculin. I was interested in what Dr. Lyon said about the tuberculous process lighting up after the administration of mercury and potassium iodide. I was not sure that treatment of this sort would cause irritation or a lighting up of the tuberculous condition, but I am convinced that salvarsan has that effect. I am sure that I have lighted up tuberculous conditions from the injection of salvarsan in patients with a double infection. It seems to me that tuberculosis of the lungs is ordinarily one of the definite contra-indications to salvarsan. The consideration today deals with a definiteluetie condition of the lung, not the combination of syphilis and tuberculosis. A certain number ofluetics are going to become tuberculous, and a certain number of tuberculous individuals will acquire syphilis. These cases of syphilis of the lung that simulate tuberculosis are of particular interest.

I do not wish to enter into controversy with the laboratory men on the subject of Wassermann reactions, but I wish to reiterate once more the fact that the Wassermann reaction is not a specific test for syphilis: it is a group reaction.

All the patients with positive reactions, even though they may be moderate or weakly positive, are sent from the Lying-in Hospital to the Syphilis Department of the Massachusetts General Hospital for observation and treatment. There is a certain number of cases that are reported as "doubtful" or "suspicious." I do not understand that the *reaction* is doubtful or suspicious, but the *laboratory man* is in doubt as to whether that patient should be called *syphilitic* or not. It would seem that more help could be given the physician if the degree of positiveness of the reaction is reported, rather than the report "suspicious" or "doubtful." The moderate and weak positive reactions to the laboratory man mean a definite per cent. hemolytic reaction. When interpreting the Wassermann findings with the clinical signs on physical examination, it may be a resolving syphilitic infection, that gives you only a moderate or weak reaction, or perhaps the patient has been recently under treatment, and thus gives a moderately positive reaction, or it may be one of the *false positives*. It leaves one less in doubt to know the degree of positiveness.

Dr. ROGER I. LEE, Cambridge: The pathology of syphilis and tuberculosis is very similar. We all know how common pulmonary tuberculosis is. On the other hand, our pathologists tell us that syphilis of the lung is very rare. The great difficulty from the clinical point of view comes from the question of diagnosis. We have no means of diagnosing syphilis of the lung in life. We cannot find spirochetes in the sputum. Even if we did they would prob-



ably come from the mouth and not from the lung. We are, therefore, thrown back on the Wassermann reaction, which, as Dr. Smith has pointed out, is, after all, not a specific reaction. The Wassermann test is of tremendous value, and, other things being equal, a positive reaction indicates syphilis. But in the presence of any very marked disease of any sort, one has to be a little chary about accepting a positive and especially a doubtful Wassermann reaction. Furthermore, the presence of a positive Wassermann reaction in no wise necessarily involves the lungs. It is a general reaction and not at all a local reaction in the lungs. We have a positive means of diagnosing tuberculosis of the lungs by finding tubercle bacilli in the sputum. On the other hand, the absence of tubercle bacilli from the sputum, even on repeated examinations, is of no great importance. If the search is persistent enough, we usually find tubercle bacilli. I should be very regretful if this section broke up with the idea that negative sputum examination for tubercle bacilli was of any real value in eliminating tuberculosis, and in suggesting that the disease was syphilis of the lung.

Dr. Lyon and the discussers have rather restricted the discussion to the question of the relation of tuberculosis and syphilis. It seems to me that it is very much wiser to accept the experience of everybody here that, pathologically, syphilis of the lung is very rare, that clinically it is certainly very rare; and to put syphilis down as one of the rare conditions of the lung. One has to admit that there are other rare conditions in the lung which may not be syphilis. Take, for example, pneumonitis, bronchiectasis or actinomycosis, that we occasionally see and cannot explain. In other words, there is a group of pulmonary conditions, usually localized in one lung, which are due to other agents, usually infective agents, than the tubercle bacilli. It seems to me that rather than to say that some chronic non-tubercular condition of the lung, even in the presence of a positive Wassermann reaction, is syphilis, we should say that the condition probably belongs to a rare group of lung infections, and syphilis is simply one of that group.

DR. ABNER POST, Boston: Some years ago I asked one of the gentlemen who had been prominent in anti-tuberculosis work what he knew about syphilis of the lung. He answered me something like this: that he knew there was syphilis of the lung, but did not know that he had ever seen it, and did not know how he should recognize it if he were to see it. We have advanced a little bit further than that. We know that there are certain cases of syphilis of the lung at the present day. We do not know how to distinguish them exactly from tuberculosis.

It is a fact that the advance in our knowledge

of syphilitic phenomena has been due very largely to the clinicians. It was denied for some time that locomotor ataxia could possibly be of syphilitic origin, because its lesions were entirely different from those ordinarily attributed to syphilis, and the clinicians established the connection. I cannot but think that our knowledge of syphilis of the lungs must be acquired in the first place chiefly through clinical study, especially if we may include radiology as a part of the clinical study, rather than through pathology. It seems to me that in cases in which there are symptoms which simulate those of tuberculosis, but in which the lesions in the lungs are unusual, and in which tubercle bacilli are not found, with a positive Wassermann test, we should not make a hasty diagnosis of syphilis; but such cases should be regarded as possibly syphilitic, and from their study we shall learn what the clinical peculiarities are, and shall acquire at length a knowledge of syphilis of the lung which will be worth while.

#### TUBERCULOSIS CARRIERS.

By CHARLES E. PERRY, M.D., NORTHAMPTON, MASS.

IN our campaign against tuberculosis we must consider the individual, the family and the public. Each is of nearly equal importance and their interests so closely allied that it is impossible to consider one without the other.

The individual's rights are to have his disease discovered at the earliest possible time and to have laid before him information concerning the possibilities of an arrest or cure if he follows the proper path, and the probable consequences if he fails to do so. He next should have an early opportunity of admission to a sanatorium, where he may be properly started on his way to health and receive an education that will be useful to him for the remainder of his life.

It is the right of the family to be protected from a source of infection and still not be deprived of the support of the wage earners, housekeepers or the comfort of loved ones for a longer period than is necessary.

The public rights should also be preserved, by protection from sources of infection, as well as by having the funds which the public provides for health work spent judiciously for the purpose for which they are intended.

At first thought, looking at tuberculosis as a communicable disease, it would seem that the problem could be solved by segregating those afflicted, but further reflection shows how obviously impracticable such a procedure would be in a State like Massachusetts, and also brings up the question as to the desirability of such a course.

It is the purpose of this paper to discuss what ought to be our attitude toward probably the



largest proportion of those capable of disseminating the disease—the tuberculosis carriers. By the term carrier, we understand a person who harbors pathogenic organisms, but who himself shows no symptom of the disease.

We have no way of obtaining knowledge of the number of carriers in the State, but there must be many thousands. One of the commissions to investigate tuberculosis in Massachusetts a few years ago stated that tuberculosis is a disease of 40,000 persons, and each one of these probably is, or has been, a carrier some of the time, and it would seem that as our death-rate from tuberculosis decreases the number of carriers will increase. Because of the increasing national or racial immunity we seem to be acquiring, and because of higher standards of living, better housing and working conditions among the poor, and better care of consumptives, with earlier diagnosis and treatment, there will be a lesser tendency for infected persons to advance to the more rapidly progressive forms of the disease, but more of a tendency to establish a resistance which will keep them above the sick line, but still with the disease process active enough to furnish abundant bacilli in the sputum.

The question, then, seems to me to be how dangerous these positive cases really are, who are able to be about and perform more or less work in comparative comfort.

Tuberculosis is a disease in which infection by the specific organism is necessary to cause lesions. There are scientific and clinical reasons to suppose that hereditary and acquired predisposition is an important factor. All persons probably have a certain resistance to the bacilli, which varies from one which is very slight, to an almost, but presumably never absolute, immunity. So in a word, infection depends on the introduction of a sufficient dose of the infecting agent to overcome the amount of immunity possessed by the individual. This resistance depends on a great many factors. Age is an important one,—the older the person the higher the grade of immunity acquired through previous infections, but also to other factors, the nature of which are unknown, but shown by the fact that the older the individual the less liable he is to have acute military tuberculosis, which form the disease takes in susceptible animals and young children without immunity. We also note the fact that phthisis is less common in the aged, and when it occurs, runs a mild, benign course.

It is the opinion of many now that nearly all phthisis is the result of an endogenous infection or an extension from an old quiescent focus acquired in childhood, which is given an opportunity to light up when resistance is lowered, as from other acute infectious diseases, anemia, malnutrition, exposure, undue fatigue, worry, insanity, especially dementia precox, and possibly physical injury. Dr. Knopf in a recent

article quotes at least ten well-known Americans of vast experience as being in accord with this view.

It has been shown by both autopsy findings and the use of tuberculin tests that very few individuals in modern civilized communities reach maturity without having been infected. The percentages vary from 50 to 98, probably differing on account of conditions under which subjects live. It has been shown that new-born infants are free from tuberculosis, and that the number of those infected increases with the age of the child, until at the age of fourteen or fifteen nearly as many are found infected as among adults.

From this it will be seen that nearly all who are infected at all, are infected before they reach the age of fifteen years. This would seem to prove that, in regard to prophylaxis, these children must be the ones to be especially protected, and the younger the child the more important the point, for, as has been shown, the younger the child, the more liable to fatal infection,—in fact children under two years of age seldom survive.

It should be a rule that all positive cases of tuberculosis should be removed from the home where there are children under fourteen years; the only exceptions being, possibly, in a family where there are plenty of funds and a high order of intelligence so there may be complete isolation of the patient, or where, for other reasons, it is more feasible to remove the child.

It may not be well to include all children under fifteen within this radical rule without further explanation. It will readily be admitted that because of the rapid form the disease assumes in children under four or five years of age and because such children have practically no resistance to the infection, absolute prevention of infection is desirable in these younger children. Fishberg states that "75% of children born during the last year of the mother's life, and 90% during the last month, succumb," and that "the exposure of an infant, even in an ideal home, may result in fatal tuberculosis, while life under adverse conditions will not produce tuberculosis unless there is a source, which is usually a human consumptive, and rarely milk derived from tuberculous cows."

It is at this period that there is the greatest danger from undiscovered carriers. Every one in the household wishes to fondle and kiss the baby and every one at times handles its food. Women are the most dangerous, because, as a rule, they are at home all day and have more ample opportunities for infecting food.

Before a child is born a careful examination should be made of every member of the household, and repeated sputum examinations made of all those who are in the least suspected. Particular attention should also be paid to the children, members, as, for instance, the grandparents or others with chronic coughs which pass on



bronchitis or asthma. In these cases the use of the antiformin method for sputum examinations is indicated. It is likely that in this way a great many carriers will be discovered.

All children should be protected from the over-affectionate visitors, who want to hold the baby or kiss or feed it. Children under three years of age should be kept at home and given no opportunities to acquire infection by travel or association with the public in crowded places.

Other children under fifteen, that is, those from three to fifteen years, we see from the study of statistics, are quite liable to infection, but it is usually of a milder sort and tends to affect tissues like bones and glands, in which the process tends to become quiescent; so here, general hygienic conditions and protection from other infectious diseases play an important part in preventing its development later into the phthisis of adults. Agreeing to this, we must not forget that these younger persons are still liable to the severer forms of the disease if the infection is massive enough or the resistance low enough. Such infection takes place only by intimate family association, as is probable in living with an open case of tuberculosis and indulging in kissing, handling of clothing and linen used by such cases, and by the ingestion of food touched by hands infected by tubercle bacilli.

Such intimate contact is not likely outside of the home, and such infection as occasionally occurs in ordinary associations is apt to be mild, and serves only as a means of immunizing the child by relatively harmless glandular tuberculosis. Indeed, this early immunization may be a saving factor in preventing us from becoming, as a race or nation, as susceptible to the rapid forms of tuberculosis as the new-born infant or the primitive races.

As a means to accomplish this separation of children from massive infection, and infants from any infection at all, we need something more than education, and advice by physicians and dispensary nurses. We need laws, and the enforcement of them by competent officials. Some of the money now spent by the public on the care of healthy individuals who may have tubercle bacilli in the sputum, but who have become institutionalized, or too lazy, selfish or unambitious to earn a living for themselves, could be well spent toward this end. Many who have tasted the pleasure (?) of free food and clothing from the board of health, and possibly a comfortable hospital bed during the winter, feel as one did I had the pleasure of knowing. He said "I have tuberculosis, and the public is bound to support me. The heaviest work I ever expect to do is to roll cigarettes." This patient was physically fit for a moderately hard day's work, although his sputum contained abundant bacilli. Such cases, as well as all incorrigible or unteachable consumptives, should be committed to a special hospital suitable for their care.

Now we come to the question of what are the

dangers to adults from carriers of tuberculosis. We have seen that most of us have been infected, and therefore have acquired an immunity which is sufficient for all ordinary use. Those who have never been infected have also a certain amount of resistance, presumably due to maturity of tissues, as well as the immunity which is general to the white race, which will usually carry them safely through life, even though subjected to occasional slight exposures.

That infections of adults may occasionally take place there is to me no doubt, for if the soil is properly prepared, when enormous doses or even frequent small doses are received from without, why should infection not occur, as well as when received from within, from the breaking down of an old process?

Baldwin asserts that "in man no absolute immunity has been observed," but that "the grafting of new exogenous bacilli in the human being in adult life, nevertheless, requires a specially lowered health or enormous doses of bacilli."

The infrequency of conjugal phthisis and of infections occurring in persons of good health who work among consumptives show that adult infections are very unlikely. Statistics of the Brompton Hospital for Consumptives, compiled for periods before and after the discovery of tubercle bacilli, show that this condition is not due to increased care in disposal of sputum.

I can see no fair reason why carriers of tubercle bacilli, in a moderately good state of health, should not be allowed the privilege of almost any occupation not having to do with the handling of food that is not to be subsequently cooked, or those occupations requiring intimate personal service, or in certain dusty trades. Possibly the danger is slight in some instances, but it cannot be so with tuberculous milkers or restaurant waiters. It goes without saying that carriers should not be allowed in occupations that have to do with the care of children, such as teachers and nursemaids. Dusty occupations, particularly those in which metallic or mineral dust is involved, should be forbidden, both on account of the liability of infecting fellow-workmen under conditions which so favorably prepare the lungs for the reception of the bacilli, and on account of the unfavorable effect of dust on the lungs of the carrier himself.

I would conclude, then, from these facts that if we segregate or isolate the advanced and dying consumptives, from whence comes the bulk of infection, eliminate from children under three years of age all chances of contact with open cases or of the ingestion of milk from tuberculous cows, prevent massive infections in older children by avoiding too intimate contact with carriers, and by general hygienic methods, and avoidance of predisposing causes, reduce to a minimum the liability of infection developing into progressive disease, we are on fairly safe ground.



## DISCUSSION.

DR. ARTHUR K. STONE, Boston: Dr. Perry has defined the term "carriers" as "those persons who harbor pathogenic organisms"—in this case the bacilli of tuberculosis—"but who have otherwise shown no symptoms of the disease." To my mind, these carriers form a small and quite distinct group. They are, for the most part, well nourished, and show none of the ear marks of the ordinary tuberculous subject. With the exception that they cough and spit more or less, they have nothing to attract attention to themselves. Usually, it is only accidentally that they are found to be carriers of tuberculosis. Often, after a brief stay in a sanatorium, or possibly simply resting, they are practically well again, excepting that tubercle bacilli continue to be found. These men soon join one of two distinct groups. Either they accept the sanatorium treatment as a pleasure, described by Dr. Perry, or they demand to be free and allowed to work out in the community. Of the two, I believe that the first mentioned is the least dangerous to the community, and it is cheaper to support him in idleness than to have him at large with the chance of infecting several others that must be cared for by the State later on. Let me briefly explain what I mean by this. If the man is simply to be cared for the rest of his life, it should be in some institution where it can be done more cheaply than at the present sanatoria: where at least he shall have something to do in return for his keep. If he wishes to work, I believe in spite of all the difficulties involved to the institution, he should be allowed and encouraged to work at the hospital or sanatorium, in whatever capacity he is capable of serving.

Under certain conditions a man may be permitted to go home and to continue his work. Here the home surroundings, and his ability and willingness to protect others, must be carefully considered before this is allowed to take place. A part of this group belongs to the semi-criminal or alcoholic class,—men with no self-respect and absolutely no respect for the rights of others. This group is a definite menace to everybody and comes into the incorrigible class, for the care of whom something must be done in the near future. This is a very perplexing group to handle. Occasionally, in alcoholic cases, one of these men is committed to jail by a court sentence and then is automatically transferred to the tuberculosis prison camp at West Rutland, where he is held during the time of his sentence. Health officers everywhere should look out for any such person that they know of, and when they are in court inform the court officers of the presence of the tuberculosis, so that this transfer may take place. Some of them really learn something up there, and during their stay, at least, they are where they are no menace to the community at large.

A number of convalescent tuberculosis patients gradually pass into the carrier class, as Dr. Perry has described. Their lungs refuse to heal absolutely. Here I should counsel patience, and then more patience, in the hope that a final arrest will be obtained. If they must work, they should be given employment, so far as possible, in some institution, or under certain conditions: especially careful cases may be allowed to return to their old, or to some especially selected new, occupation. This should be permitted only with great reluctance, especially in those cases where there is any contact with children.

The question has been raised whether these persistent carriers are dangerous where the bacilli have become attenuated, and therefore non-pathogenic. There is nothing to prove that they are not dangerous. Typhoid fever carriers have been found to be persistently and constantly sources of new cases of typhoid. We must all bear in mind the story of Typhoid Mary. Many years ago I made a study of a number of cultures of diphtheria bacilli from a number of persons who had become clinically well of their diphtheria, and found that the diphtheria bacilli were active and very virulent. Dr. Theobald Smith, and Dr. Baldwin, of Saranac Lake, were written to on this subject. They replied that the statement that the bacilli of tuberculosis in carriers are non-virulent is quite unwarranted. Some bacilli, Dr. Smith said, might be considered to be attenuated, or atoxic, but the point could not be determined until cultures had been tested. Dr. Baldwin's reply was along the same line. Therefore, it is not possible to consider any of these carriers as non-infective, but we must consider them dangerous to the community at large.

DR. ADAM S. MacKNIGHT, Fall River: It is very apparent that we must consider this "carrier" subject from different points of view. First, from the standpoint of the physician in charge of an institution; and second, from the standpoint of the physician in every day practice, who has to do with the patient in his home, in his social relationships, with his family. Dr. Perry spoke of the three-fold relationship,—the individual, the family, and the public. It is also apparent that these relationships must be dovetailed in a friendly, helpful way. In other words, the individual with an active tuberculous lesion has certain family ties, and certain duties to perform. There is no reason why tuberculosis should be the cause of upsetting all the relationships of life. In too many cases, when the note of tuberculosis is sounded in a family, it practically means a separation, certain "phobias" come into the minds of the friends and relatives, while the patient, who has his or her own troubles to consider, is set away at an unripe or an unfit time, which, of course, subjects the family to all sorts of discom-



ment, and hardships. The individual, the family, and the public rights, must be considered. At the present time, it seems, we are just "waking up" to the public recognition, that the individual and the family rights must be protected, in the event of separation—due to tuberculosis.

We must not consider the "tuberculosis carrier" in the same class with the "diphtheria" and the "typhoid carrier." The relationship is entirely different. In the case of a tuberculous mother and child, realizing, as we all do, the danger to the child, we must take into account the terrible anguish that comes, when that child is taken away from the mother, or the mother from the child. Take the cases of glandular conditions without any open lesions. In the bone and gland tuberculosis, without any discharge, there is nothing to create the terror of the "carrier" theory.

I should like to differ from Dr. Stone in the way he would handle that "cigarette roller," mentioned in Dr. Perry's paper. I do not think the tuberculous individual of that type deserves any State recognition or, in fact, any recognition whatever, whether he has a positive or a non-positive sputum. I think one of that type should be discharged from a sanatorium, and made to earn his living, and the place he occupied should be given to one of the opposite type—the one who wants to protect himself, his family, and the public. The sooner the public recognizes that condition, and deals in proper manner with the "cigarette roller," the better.

Dr. Perry's definition of a tuberculosis "carrier" is, in my opinion, open to question, and might be somewhat modified.

DR. CHARLES J. DOWNEY, Springfield: In rising to discuss this paper, I feel that we are all indebted to the author for his practical and sane treatment of the subject, and I wish only to emphasize a few points in connection with what he has already said.

Tuberculosis is a body infection. Consumption, phthisis, tuberculosis of the lungs is but the end-result, a final stage of a long-continued semi-pathologic process.

Tuberculosis is an infectious disease, with the infection being nearly always acquired in infancy or early childhood, attacking the lungs in later life, and producing the disease which has been recognized, so long as there has been civilization, as phthisis or consumption.

It is a disease which lasts a lifetime, beginning in infancy and ending in the grave. This being true, infancy and childhood is the field where the battle against tuberculosis must be most vigorously waged.

When we consider that about one-third of the country's population is made up of children under fifteen years of age, and when we consider also that upon the environment of child-

hood depends largely the physical and mental vigor of a nation, we cannot fail to realize the great importance of laying the foundation of an intellectual and vigorous race of people at the earliest date possible.

I agree with Dr. Stone that special hospital accommodations should at this time be speedily provided for the incorrigible and the unteachable cases, who are a menace to the public when at large. We must continue to give the milder adult cases prompt treatment, that the disease may be arrested so that they may return home to the support of their families in the least possible time. But when we touch the children, our duty becomes an all-appealing and a sacred one, and should be grappled with in a courageous manner and with a liberal supply of funds.

Poverty is the great associate of tuberculosis. Men on a laborer's wage increase their families more rapidly than they do their income, and they soon find that they have to feed, clothe and protect a family of six or seven on the same wage that a few years before was used for earning for two or three. The quarters are no larger: there consequently is smaller space for breathing per individual. There is breathing of expired air: the atmosphere is fouled.

The result of all this is diminished power of resistance and a greater susceptibility to disease, especially of the respiratory tract.

We have a problem of education of the families; a problem in home life. If a large percentage of our adult poor have tuberculosis it is mandatory that we all attack the problem in the home, where infection takes place at so early a period in life.

We have worked in the past according to the light we had. As we have become better informed and have had more knowledge on the subject, we must change our viewpoint; we must attack the problem in a new and a better way.

DR. FRANCIS P. MCCARTHY, Brighton, Mass.: In my two years at the Boston Consumptives' Hospital there were about 80 autopsies in tuberculosis. In two years in the Canal Service in Panama, I saw about 200 more autopsies in tuberculosis. In the past ten years there have been about 5000 autopsies done on a large number of cases, including over 1000 cases of advanced syphilis. There were no cases of pulmonary syphilis in this group of cases. The question comes up today as to whether the pathologist is overlooking syphilis of the lung. I do not think he is. Routine examinations frequently are made to find spirochetes in questionable lung nodules or in the walls of the bronchi. None have been found in these cases in question. The finding of treponema in the aorta and brain would indicate that we ought also to find these organisms in lung processes of syphilitic origin. The problem seems to be purely patho-



logical. Until the pathologist reports increasing numbers of cases of syphilis of the lungs, the disease is still rare. If we discover in the future more cases of lung syphilis, as a result of pathological and bacteriological examination, then the disease is becoming more common. Last year at this meeting there were cases reported where patients in the active secondary stage of syphilis had signs in the chest which might simulate tuberculosis, even to the expectation of a certain amount of blood. This process in the chest is probably a bronchitis, with engorgement of capillary vessels of the bronchial mucosa, with rupture of these vessels, and of a transient nature, occurring in the secondary stage of the disease.

Dr. Hinton brought out the point that the finding of positive sputum and negative sputum in relation to the Wassermann test, is very important. In the positive Wassermann cases the sputum is not any more often found negative than in the negative Wassermann cases. I still think that the disease, as Dr. Lee has brought out, is rare, and is not becoming more common, and until the disease is recognized at the post-mortem, the clinician must keep the diagnosis of syphilis of the lung in abeyance.

Dr. E. O. Otis, Boston: I would like to emphasize Dr. Perry's very conservative and, in my opinion, just statement, that carriers who are able should not be prevented from engaging in any occupation, with the exception of such a one as would bring them into intimate contact with children. We talk very glibly about the isolation of the consumptive, and in certain cases this is the only obvious thing to do, as with the incorrigible consumptive. There are a large number of the active tuberculous individuals, however, whom we shall never be able to isolate, and it would be an unwarranted infringement upon their liberty if we could do so, for according to our Declaration of Independence, all men have the "inalienable right to life, liberty and the pursuit of happiness." However, the consumptive in his "pursuit of happiness" must not jeopardize the happiness of another. All we are warranted in doing is to educate the consumptive who is about among people so that he will not be a menace to others.

In our campaign against tuberculosis we have so alarmed the public that the poor consumptive is not infrequently made to suffer unreasonable hardship. I recall the case of an active tuberculous person of comfortable means for whom I tried to find a home. After vainly trying several private hospitals, she finally found a place in a hotel. Again, a single gentleman with advanced, active tuberculosis, and yet able to attend to his business, told me that he was living at one of the hotels in the city, as he considered that in this way he could best conceal the fact of his disease. As there was generally a new person in the adjacent rooms every night,

his paroxysms of coughing were not complained of. It seems to me that we have got to accept whatever risk there may be in the tuberculosis carriers who are about, just as we take many other risks in life. We cannot isolate all active tuberculous cases or carriers. All we can do is to see that they are properly instructed as to the protection of others from their infection, and trust to their conscientious observance of the rules of prevention.

Dr. CLEVELAND FLOYD, Boston: This term "carrier" was originally applied to convalescent typhoid fever patients who were free from clinical symptoms and signs of the disease, but there was a carrying about of the organisms which could produce the disease in others. The word "carriers," as applied to tuberculosis, should be restricted to a very limited number of patients who are without signs and practically free from symptoms. There are such cases in all large clinics. Such a person will come in because urged to do so, having a little clearing of the throat in the morning, but no clinical signs or symptoms. These patients occasionally show tubercle bacilli in the throat clearings. I have seen two or three yearly whom I should say would come under this head, where repeated chest examinations, not with x-ray, but with ordinary clinical examination, showed nothing in the chest. We should limit the term "carriers" to this type of infection.

The question then arises as to how dangerous patients clinically discharging tubercle bacilli are to the general public. Some time ago I took a series of fifteen cases, collected their sputum, isolated the organism, grew it out on media, and injected the living organisms into a series of guinea pigs to see what I could find out as to the variation in the virulence of the organisms. Some of these cases were in the second, some in the third stage; some had run but one year, some five or six years, but were still throwing off bacilli. In all these fifteen cases there was a variation in the length of time the disease had run. The more chronic the disease, the longer the animal lived, but in every instance the animal succumbed. This may give us some idea as to whether we should allow these people to be at large in the community. At the Mattapan Hospital today there are a number of men who have been there from one to five years. I do not believe that the person who is throwing off tubercle bacilli, and who is ignorant and careless, should be allowed at large in the community. I think the place for that man is in a hospital, even if it is necessary to keep him there under compulsion. I do not mean to include in that group the man who is well trained and educated. We must expect that he would naturally consider other people, but sometimes, even among the most carefully trained and educated, there is often a lack of care.



If this is true among the trained, what can we expect from the ignorant and indifferent consumptive? Such cases should be isolated as long as they are a menace. In this way alone can we hope finally to check this disease.

### WHAT CONSTITUTES CLINICAL TUBERCULOSIS IN ADULTS?

By GEORGE L. SCHAPT, M.D., SPRINGFIELD, MASS.

THE correct answer to the question as asked in the title of my paper this afternoon would be as welcome probably as would the correct answer to the question of a decade ago, "How old is Ann," and I, for one, feel that it would be just as welcome. Any discussion that has to do with the necessary factors, such as history, constitutional symptoms, physical signs, considered requisite for a correct diagnosis of clinical tuberculosis in the adult, is of necessity more or less a compilation of the ideas and experiences of other men working along similar lines, and to some extent the conclusions reached from the observation and study of many cases by the individual.

I trust that I shall not appear dogmatic in my remarks and the conclusions reached, but it would seem that dogmatism on the part of many of us is more or less necessary in arriving at general conclusions as to the values to be placed upon the different factors necessary to the making of a positive diagnosis of active pulmonary tuberculosis in the adult. If it were possible for us to make definite answer to such an important question, one so far-reaching in its effects and results, economically and otherwise, we would be far along toward ultimate victory in the campaign against tuberculosis; it would make the work, of not only the general practitioner, but of the expert as well, much easier. This question, however, cannot be answered by the setting aside of one or two constitutional symptoms and one or two physical signs, and saying that these together in every case make up the symptom-complex necessary for the diagnosis of clinical tuberculosis. Smith<sup>1</sup> well says: "There is no easily applied test for clinical tuberculosis. A negative physical examination is not conclusive, and a prolonged observation of the general health is often necessary." Pottenger<sup>2</sup> says: "That in studying the clinical history and the symptom-complex of pulmonary tuberculosis, everyone must have been more or less impressed with the indefiniteness of the symptoms and signs connected with this disease. There are some 25 or 30 different symptoms which accompany early tuberculosis, and even more in advanced tuberculosis; and, if we think of each symptom as an individual entity, there is no end of confusion." He also says: "It is characteristic of the symptoms of early tuberculosis that they are inconstant.

We do not find any single symptom or any particular group of symptoms present under all circumstances."

We can no more say that a slightly increased pulse rate with a little temperature elevation means active tuberculosis than can the general practitioner say that a dirotic pulse and a positive Widal in every case mean typhoid fever. For in either case we may have other conditions simulating tuberculosis on the one hand, and typhoid on the other, from which it is very difficult to separate the true from the false.

Personally, it does not seem to me that consideration of this question limits us to the consideration of what constitutes the diagnosis of so-called incipient tuberculosis only, but that rather, we should take a broader view of the question and consider this afternoon what we need in each individual case to make a positive diagnosis in the patient presenting with symptoms simulating either early tuberculosis, moderately advanced tuberculosis or far advanced tuberculosis. Evans<sup>3</sup> some time ago called attention to the fallacy of using the term "incipient tuberculosis" in describing a condition, the pathology of which was sufficiently advanced to give rise to demonstrable physical signs, and that true incipency in lung tuberculosis is not clinically demonstrable. I believe that as many errors in diagnosis are made in those adults seeking us for advice with symptoms which they or their medical adviser construe to mean tuberculosis not alone in the early stages, but in the later stages, and I feel that many of you will agree with me when I say that, looking back, we can recall that in many a patient who presenting with fever, increased pulse, cough, and perhaps a râle, it was with the greatest difficulty we were able to arrive at any definite conclusions, if we arrived at any. I feel no hesitancy in saying that, for my part, the diagnosis in these people has caused me as much concern as any with whom I have been confronted.

It would seem that we have clouded the diagnostic field in the last few years by focusing our attention simply upon the question, is or is not this a case of beginning pulmonary tuberculosis, and losing sight of the many that come asking the question, have I or have I not active clinical tuberculosis, and bringing definite symptoms of some pathological condition existing in the pulmonary tract, not necessarily tubercular, but demanding just as sincerely a diagnosis, and in so demanding calling upon the highest degree of medical equipment and scientific accuracy for making the correct one. I cannot but feel that it is here that most errors in diagnosis are made, notwithstanding the widespread feeling that seems to prevail among the medical profession, that it is a simple matter to make a diagnosis of tuberculosis in the moderately advanced or far-advanced stages.

Minor<sup>4</sup> of Asheville, in discussing a paper at



the recent National Tuberculosis Association Meeting in Washington, said, that in his opinion, it was the inadequacy of ability to listen and to interpret signs and symptoms in making an early diagnosis of tuberculosis that accounted for so many errors. He also emphasized the fact that most general men look for loud moist râles before making a diagnosis of incipient pulmonary tuberculosis, but that it was his opinion that when these were heard the case was advanced beyond the incipient stage. I would again emphasize it as my opinion that it is the inadequacy of ability to listen and to interpret signs in the making of a diagnosis in the advanced stages also that accounts for the presence in the many sanatoria of the non-tuberculous cases and those coming to autopsy.

During the last year<sup>5</sup> 1629 patients were admitted to the four sanatoria of this State; of this number 12 were non-tubercular and 16 not determined or classified. I do not quite understand the meaning of the term "not determined," unless it means that these cases were sent in without diagnosis or had not been examined before the report was made up. However, we have here 28 patients out of 1629 who either did not have tuberculosis or in whom it was questionable—a matter of 1.6%. Ash,<sup>6</sup> in a careful study of the pathology of the mistaken diagnoses at the Boston Consumptives' Hospital analyzed 198 necropsies performed in that institution since its foundation; 23, or 11.5%, proved to be non-tuberculous, in so far, at least, that there was no active lesion demonstrable. The anatomic diagnoses were:

	No.	Percentage of Non-tuberculous.	Percentage of Total.
Pneumonic sequelae	8	34.5	4
Chronic cardio-renal	5	30.5	3.5
Aneurysm of aorta	2		
Malignancy	5	21.5	2.5
Septicæmia	2		
Actinomycosis	1	13.5	1.5
		100	11.5

He also collected 353 necropsies performed at other institutions, and of this number 38, or 10.8%, proved to be non-tuberculous, showing, as he says, that the experience is not a local one, confined only to this institution. Anatomic diagnoses of these cases were:

	No.	Percentage of Non-tuberculous Necropsies.	Percentage of Total Necropsies.
Pneumonic sequelae	3	8.0	0.8
Cardio-renal	22	58.5	6.2
Aortic aneurysm	4	10.5	1.1
Malignancy	2	5.0	0.6
Septicæmia	2	5.0	0.6
Syphilis	4	10.5	1.1
Pellagra	1	2.5	0.3

In his conclusions Ash says, "It may seem radical to be sounding a warning against diagnosing tuberculosis, but it must be remembered that we are dealing here with types of cases

that are confused with those in the advanced stages of tuberculosis, in which it is very unlikely to be overlooked; and that we are not considering the early stages of the disease, in which the tendency is to err in the other direction, that is, fail to recognize the presence of the infection." Hawes<sup>7</sup> mentions many conditions that were wrongfully considered to be tuberculosis, among them chronic influenza, hypernephroma of the lungs, chronic empyema, syphilis and abscess of the lung. Luetscher,<sup>8</sup> in an interesting study of respiratory infections, asserts that 62.5% of all non-tuberculous infections below the larynx are due to pneumococcus and 28.5% to the influenza bacillus, and that these organisms together cause 91% of the infections of the bronchi and lungs, 75% of the infections of the larynx, and 31% of the infections of the nose, throat and sinuses.

From a consideration of these figures, it would seem that there are certainly enough errors in the diagnosis, not only of the early case, but of the old case as well, to cause us to pause and carefully to consider and correlate the physical signs and constitutional symptoms of each individual case and not make a diagnosis upon one or two symptoms that may indicate that the individual is suffering from some vague infection in the pulmonary tract, and not, of necessity, infection with the tubercle bacillus. Blue-mel,<sup>9</sup> among a large number of soldiers sent to him with the diagnosis of pulmonary tuberculosis, found that 80% did not have the disease. The symptoms and signs which had led others to the diagnosis were cough, pain in the chest, expectoration, and slight evidence of the impairment of resonance over the right apex, with some changes in the breath sounds. When we stop to consider the enormous number of individuals being sent yearly to the different State sanatoria, not only in Massachusetts, but in every State in the Union, and when we consider the numbers sent who are not tubercular, it should cause us to speculate upon the adequacy of our individual ability to interpret the signs and symptoms of this infection and to endeavor to formulate in our own minds a symptom-complex or symptom-complexes that will permit us to say with more accuracy than we have in the past that this man is tubercular or that this man is not tubercular.

I would not wish you to feel from the foregoing remarks and from any I may make later that it is my desire to belittle the efforts of the general practitioner or expert in the diagnosis, but I do wish to express the opinion that we must use more care in correlating the evidence leading us to label any one as tubercular. It is Fishberg's<sup>10</sup> opinion that from the social and economic standpoint a diagnosis of tuberculosis is a serious affair and that we should not hurry in making it. "There are some of our ground," it is argued, "tuberculous, to be cured, must be taken hold of in time, and that



there is comparatively little harm done if a few persons are inconvenienced, provided the vast majority of tuberculous persons are discovered in time. This would be important if true, but it is not. That all tuberculous patients could be cured if discovered in the incipency of the disease is one of the numerous traditional errors which abound in practical medicine and the sooner we are rid of this error the better for the patients and for the physicians.

It is my firm conviction that as many, if not more, individuals are every year labeled with the diagnosis of pulmonary tuberculosis on just as insufficient grounds as are sent away from our offices with the diagnosis of non-tuberculosis after insufficient examination and consideration. I am certain that many will agree with this statement, when it is recalled how many lesions of the pulmonary tract may simulate in every detail pulmonary tuberculosis presenting varying symptoms from hemoptysis, rapid pulse, temperature, and cough to extreme emaciation and death. Agreeing with Fishberg,<sup>10</sup> it has been a question in my own mind whether the feeling so prevalent is correct, that it is better to be mistaken in making a positive diagnosis on one innocent person, than to err in not making a diagnosis on a tubercular. More and more I am convinced that this feeling is not right and just, and that if we would but use more care in our examinations, with a better understanding of the symptomatology and physical signs, availing ourselves of the scientific methods of diagnosis at our disposal, we would be able to say more definitely in practically every case whether the disease exists clinically and is active.

I trust that I shall not be misunderstood in my remarks and have you think that I desire to belittle the work and endeavors of those who strive for the earliest possible diagnosis of this disease, for I appreciate as much as any one the extreme value of early diagnosis. It is rather my belief, however, that in seeking the early diagnosis and the late diagnosis also, that we should endeavor by all means at our hands to make it correct as well, remembering that there are other pathological entities, which may resemble tuberculosis in every respect, within the thorax.

I wish next to consider the question of the values that shall be given the different signs and symptoms due to pulmonary infection which we consider necessary in enabling us to say definitely that active tuberculosis is or is not existent in the lung tissue. In this discussion, we run the scale from the time of Hippocrates and Galen, who wrote so much on the so-called "habitus phthisicus," and who placed so much dependence upon the presence of this so-called phthisical chest in the making of a diagnosis, to the so-called modern practitioner, who still insists and demands a positive sputum

with the presence of bacilli before he makes a diagnosis of beginning tuberculosis. We are all of us more or less prone, I believe, to have ideas as to the values of the different signs and symptoms required before we individually will make a diagnosis. I think that in many clinics, that in many private offices as well, a patient presenting for examination and diagnosis is too often approached by the examiner with his mind prejudiced by certain symptoms, such as cough, night sweats, etc., more or less made up as to what he should and what he must find to tally with them in the examination of the chest, considering every patient as tubercular until proven otherwise.

As one is confronted with the numerous articles bearing upon the subject of the diagnosis of tuberculosis, it is truly amazing to note the differences apparently existing in the minds of the writers as to the requisite signs and symptoms which they deem necessary and demand before making the diagnosis. Some years ago, it was whispered abroad that a well-known phthisiologist claimed that it was possible and that he would himself make a diagnosis of clinical tuberculosis on a rapid pulse, from 90 to 100, maintained during rest, and in the absence of any other constitutional symptom or physical sign. From this tyro, and the general practitioners and experts who insist—and perhaps they are right—that every case of hemoptysis is tubercular in origin, to the general practitioner who still insists upon the absolute necessity of positive bacillary findings in the sputum before labelling the patient as tubercular, it is a long road. We have, also, those men among us who, overcome by the brilliancy of the radiogram, hypnotized by the brilliant diagnostic skill and verbal acumen of the roentgenologist will permit a diagnosis of active clinical tuberculosis to be made on the radiogram alone, in the absolute absence of any signs or symptoms, permitting the patient to be sent away on these slender grounds.

It has been a source of much interesting study during the past few years to observe the varying symptom-complexes which different competent men of my acquaintance have insisted be present before they would make a diagnosis, and in many cases making a wrong diagnosis because of the presence of some symptom or sign, or both, considered by them as always belonging to pulmonary tuberculosis and to no other condition. The number of men who still insist on cough, dulness, râles, and in some cases positive sputum before making a definite answer, is astonishing. The same may be said of the number who, in the presence of cough, dulness, râles and other signs of an apparent moderately advanced or far advanced case of tuberculosis, but without any symptoms whatever, invariably make an immediate diagnosis of tuberculosis, without proper or careful analysis of the condition in all its phases.



I was much interested while in Washington last month, in ascertaining from some of the men present, the signs and symptoms, and the values they gave them, upon which they would make a clinical diagnosis of tuberculosis in the adults. It was very interesting to see the way in which different signs and symptoms were valued. For instance, how much dependence one man placed upon some factors, such as temperature and pulse, and again how little another man placed upon the same. I wish only to cite the opinions as given me by two or three men present. One gentleman of long sanatorium experience said that he insisted upon the presence of a localized râle or râles in the lung at or near the apex before making a diagnosis of clinical tuberculosis in the adult, notwithstanding the constitutional symptoms presented. Another gentleman placed a great deal of stress upon the history, particularly of contagion, and upon the constitutional symptoms demanding an afternoon temperature of 99.5 and a pulse between 90 and 100. He did not, however, insist upon the presence of the râle. The third man also placed much dependence upon the history, and said that in his opinion dyspnea was always one of the early symptoms of clinical tuberculosis. That dyspnea with an increased pulse rate and afternoon temperature with cough were the four symptoms upon which he placed the greatest reliance.

From the consideration of only these three differing opinions, I believe it can be realized how difficult it is to arrive at a conclusion as to the ideal symptom-complex in the making of our diagnosis. It seems that the value of the different constitutional symptoms and signs following infection produced by the tubercle must always remain more or less individual, and that there must always be a question of personal equation and the varying abilities of the men, as Minor, quoted above, has said, in interpreting signs and symptoms. I do not believe anyone, no matter how experienced or expert, can say dogmatically that this or that symptom-complex means tuberculosis in every given case, but that it is rather a judging of the values of the symptoms and signs, individually and collectively present in each patient, that will aid us.

I feel that between the varying demands here represented, we have, on the one hand, those who make their diagnosis on a foundation too slight and, on the other hand, those that demand too much; and in my opinion one is as bad as the other. Both are irrational in their methods of diagnosis and show the need for more serious study in each individual case and better correlation of the history, physical signs, and constitutional symptoms. It would seem that for some time the diagnosis of clinical pulmonary tuberculosis has been regarded as a very easy problem and that the responsibility resting upon the physician for labelling a man or

woman as a tubercular is *nil* and not to be considered of any importance. I do not agree with this attitude and feel that we should withhold our diagnoses until we are convinced in our own minds that tuberculosis is present.

As intimated before in this paper, I believe it is impossible for any one man to say that any one particular group of symptoms or signs would always mean tuberculosis in the adult. From my experience, I am convinced that a patient may present with varying symptom-complexes of all sorts and types of symptoms and signs and yet upon many of them we will be unable to make our diagnosis. I feel certain that many will agree with me in this contention. It is not my purpose in this paper, in considering the signs and symptoms necessary for a diagnosis of clinical tuberculosis in the adult, to go into the anatomical explanation and the pathological conditions that make for each sign and symptom. I do not feel that I should take your time in doing so, nor do I feel it necessary to go into the consideration of every possible sign and symptom which a person with some pathological condition existing in the pulmonary tissue and adnexa simulating tuberculosis may have, since many of them are of very little value at best. It is my purpose rather to take up some of the signs and symptoms which in conjunction with other signs and symptoms convey to our mentality definite conclusions.

Heise<sup>11</sup> of Saranac Lake, in discussing a paper on the early diagnosis of pulmonary tuberculosis at the recent National Association Meeting in Washington, brought out a number of very interesting points which I think would be of interest here and would perhaps make clear in the minds of many why two or three persons of the same apparent amount of infection react so differently. He emphasized the fact that we must always bear in mind that there are two types or classes of tubercular infection of the pulmonary tract, one the peribronchial type, and the other the parenchymatous type. He again emphasized the fact that in both, the constitutional symptoms of fever, rapid pulse, cough, etc., are present in equal degree, and also that the physical signs were the same in many of the cases. The important point to my mind that he brought out, however, was that in only 3% of the peribronchial type of infection were tubercle bacilli found in the sputum while 17% of the parenchymatous type of infection showed them present, also that the percentage of relapses in the peribronchial were only about one-half, or 50%, of the relapses occurring in the parenchymatous type. A reconsideration of the cases that many of us have seen with these remarks in mind, will, I am sure, clear up the reasons why we never found the tubercle bacilli in the sputum in some of our relapses were so frequent in others.

Pottenger, in a very interesting article of recent date has suggested that these relapses of



early clinical tuberculosis be classified according to their etiology, grouping them into three groups: those caused by the toxins, those of reflex origin, and those due to the tuberculous process *per se*. As he remarks, some have a double etiology and will be found in more than one group as will be seen by referring to the table below:

TUBERCLE TOXINS.	REFLEX ACTION.	TUBERCULOUS INVOLVEMENT PER SE.
Malaise.	Hoarseness.	
Feeling of being run down.	Indigestion or loss of weight.	Frequent and protracted colds.
Lack of endurance.	Chest pains, particularly aching	Spitting of blood.
Nervous instability.	of the shoulders and over the	Sputum.
Indigestion or loss of weight.	apices and upper portion of	Pleurisy.
Night sweats.	lung.	Temperature.
Temperature.	Tickling in the larynx.	
	Cough.	
	Increased pulse rate.	
	Flushing of face.	

A study of these three groups will reveal that we have here every possible symptom that might be expected to occur following pulmonary infection with the tubercle bacilli or other infecting organisms, and also other infecting and pathological conditions outside the pulmonary tract. I think it well to bear in mind that any one of these symptoms or many of them may be caused by conditions outside the thorax. As Hawes<sup>13</sup> well says, "Failure to bear in mind that it is perfectly possible for a person to lose weight and strength, become weak and even develop a cough and run a fever without this being due to tuberculosis, is to be kept in mind. In these days, when the professional and lay mind is constantly being prodded in regard to tuberculosis and its cure and prevention, it often happens that the young and enthusiastic medical student or physician becomes imbued with the idea that tuberculosis is the cause of all our chronic coughs, colds, and run-down conditions. To a large extent this is undoubtedly true, but the fact that there are many other causes of such conditions must not be forgotten."

I am certain that none of us would care to take the responsibility of making a definite diagnosis, breaking up a home and sending a patient away on one or two of these symptoms alone, but would rather require a number of them and other factors before making up our minds. It is not possible, in my opinion, to classify the physical signs due to invasion of the lung tissue in a manner such as this, in view of the fact that so many pathological conditions may cause signs exactly similar to those produced by the tubercle bacilli from the r  le, consolidation, transmitted voice to bronchophony, pectoriloquy and signs of cavitation.

I have become more and more convinced in the last few years of the value of the history in the making of a diagnosis. I do not contend, as do some, that it is possible to make a definite diagnosis on the history of tubercular exposure, not alone in the family but from a room mate, shop mate, a school companion or what not, but

it is certainly of the greatest possible aid to us. Hawes<sup>13</sup> puts the matter in a nutshell when he says, "There is probably no disease whose onset is so insidious as tuberculosis, unless it be some forms of gastric cancer. There certainly is no condition in which a detailed and painstaking history is of more real value in diagnosis, as well as in future treatment." Many other com-

petent observers have in recent articles repeatedly emphasized the value that consideration of the history gives in the making of a diagnosis. It would seem, however, that many general practitioners ignore the question of the history completely, contenting themselves with a little percussion and a little auscultation of the chest, basing their opinion upon those factors alone. I do not think the value of the history in making a diagnosis, not only in the so-called incipient or early stage of tuberculosis, but also in the moderately advanced stages can be emphasized too much, or brought to our attention too frequently.

Let us now consider the constitutional signs and their values. I feel that Pottenger has, indeed, made it very easy for us in his explanation of the signs from the etiological standpoint, as just mentioned. He says that signs due to the toxin itself are not indicative always of an infection due to the tubercle bacilli, but may be caused by any infection that depletes the organism. Surely malaise and the feeling of being run-down are always prevalent. Instability can never be considered as a symptom in any way of infection with but one bacillus, nor can night sweats nor temperature. Any and all of these symptoms may be experienced by persons suffering with almost any low-grade infection. Without a definite history of tubercular contagion, I feel that most of these symptoms are of little value; with a history, of the greatest value.

*Indigestion or Loss of Weight.* How frequently we see patients who come complaining of a little anorexia, a little indigestion or a little loss in weight. There is certainly much misunderstanding about the normal weight in a given individual, and, as a matter of fact, I think that the average man knows as little about his normal weight at any time as he does about anything. This symptom itself is of little value unless accompanied by several other symptoms.

*Temperature Curve.* In the early diagnosis of tuberculosis, the temperature curve is of



great value, and particularly so if other suspicious symptoms are present along with it. In the consideration of this symptom, a few remarks regarding the necessary care and exactness required do not seem out of place. It would seem that too many men are content to take a morning and an evening temperature, specifying neither time at which it shall be taken nor how long the thermometer shall be kept in the mouth. It is my opinion that the ordinary temperature chart kept in this way is valueless. It teaches us nothing. The ideal temperature chart in the suspicious case should be taken every two hours, or if this is not possible, the first temperature should be taken on awakening, again at 12 M., again in the afternoon about 4 or 5, and again about 8 P.M. The temperature chart kept for two or three days is of little value, but should rather be kept at least a week as outlined. It perhaps seems unnecessary to remark that the patient should not take the temperature after having had hot or cold drinks in the mouth; but how often we see just this thing done, and naturally the chart loses its effectiveness.

**Night Sweats.** Night sweats may be due to the action of any particular toxin on the vasomotor system, causing lack of tone and undue relaxation,—a symptom in my opinion the value of which is somewhat exaggerated, and one upon which I do not think it possible to make a definite diagnosis of tuberculosis alone.

Let us next consider the symptoms due to the reflex action of the tubercle toxin. These, as a consideration of the chart will show, vary from hoarseness, chest pains, tickling in the larynx, cough, etc.

**Hoarseness and Chest Pains.** Hoarseness is often found as one symptom of early tuberculosis. We all appreciate how common it is in the advanced stages, when necrosis is present and cavity formation has taken place. I feel that we should pay more attention to the aching over the shoulders and over the apices of the upper portion of the lungs and the chest pains, for it is remarkable the number of patients who complain of these pains and aches early in the infection.

**Cough.** The cough, which is probably the first symptom appreciated by the patient, above all others, and the one which brings him to his family physician or the specialist, is not necessarily due to the tuberculosis of the lung, and we should not prejudice our minds with that fact. That it is difficult for the laity with very little elementary knowledge of medicine, not to be impressed with this symptom, is not surprising, and I think it is the one symptom that always means pulmonary tuberculosis to them. This condition should not obtain among trained medical men, but that it does we must admit, and that there are medical men who still are impressed greatly by this symptom is a fact. I do not exaggerate when I say that the word cough

and the symptom itself convey to the minds of us but one pathological entity—tuberculosis. It is regrettable and I believe the reason for more errors in diagnosis than any other one symptom.

**Increased Pulse Rate.** This particular symptom, and again I would emphasize that it is not a pathognomonic symptom of tuberculosis infection in any sense, since the toxin action of any infecting organism causes an increase in the pulse rate, and one of the symptoms we expect and look for. As yet, I am not prepared to accept the pulse, in the absence of other symptoms or signs, as an indication of tubercular infection.

These reflex symptoms are not in any way distinctive, yet they are much more so than symptoms due to toxins themselves, and if accompanied with other symptoms, should arouse suspicion regarding possible infection of the pulmonary tract with tubercle bacilli.

Pottenger,<sup>2</sup> speaking of these groups, says that there is nothing distinctive of tuberculosis in that group which is due to toxemia, and that he was further impressed with the fact that the second group, those of reflex origin, all point to organs other than the lung, but that they belong to organs which are supplied by the vagus and sympathetic nervous systems, both of which supply the lung.

**Symptoms Due to Tuberculous Process Itself *per se*.** That there are a few symptoms due to the tuberculous process itself is self-evident, and that they are probably the most important we have in early clinical tuberculosis is also evident, but we must not forget that they may at any time, and in any place, mislead us. The unfortunate part about these most important symptoms is the fact that as a general rule they appear later than do some of those due to the tubercular toxin and the reflex action of the toxin. They presuppose, either an involvement of some duration, or one of an area of considerable extent. In fact, when we make a diagnosis of clinical tuberculosis, it has, as a rule, existed for some time, and there is always a considerable area involved. These symptoms should be rarely mistaken for any other disease or condition. I wish, again, at the expense of repeating myself, to recall to your minds Evans' remarks upon the diagnosis of so-called incipient tuberculosis. It is in this group of symptoms, due to the tuberculous involvement *per se*, that we find the symptoms that are more definite and that help us more in reaching conclusions as to the process present in the diseased pulmonary tissue.

**Frequent and Prolonged Colds.** A history, and it is a common one, when a patient comes saying that it has been a winter or a spring of frequent and protracted colds, to get over one cold but to get another, means our bias toward the diagnosis, taken in conjunction with other symptoms or signs that may be present. I have been impressed during the last year with the num-



ber of patients who have come with this history, and presented, among other symptoms, a definite temperature curve, increased pulse rate, a little loss of weight, and perhaps night sweats. I am afraid that in many cases these attacks are passed over with the catch-all diagnosis of la grippe, but inquiry will usually show that these colds are not frequent attacks of grippe, but that they often start as a bronchitis and at other times as head colds, ending as bronchitis. A history of frequent and protracted colds with temperature elevation should always arouse suspicion and should call for most careful investigation, and physical examination.

**Hemoptysis.** Hemoptysis, or spitting of blood, with the possible exception of cough, is, perhaps, to the mind of the average medical practitioner, the most important and diagnostic sign that exists in tuberculosis. It is regarded by many that hemoptysis always means tuberculosis until proven otherwise.

Pottenger<sup>12</sup> says, "While there are other causes for this symptom, yet the fact that the patient raises blood is presumptive evidence that tuberculosis is present, and the evidence is conclusive in most cases when the blood is bright and mixed with sputum." Riviere<sup>14</sup> quotes Barnes as having found hemoptysis the initial symptom in 15% of cases, Bonney among 546 cases (20%), and Bartlett in only 6% among 400 cases. He further says, "The value of a well-marked hemoptysis is so great as to make this symptom, when well authenticated and other causes can be excluded, well nigh pathognomonic of tubercle. It is, then, of the utmost importance that with a free hemoptysis, other causes being excluded, phthisis should be presumed." Lord,<sup>15</sup> in a recent and most excellent paper, says that it is his belief that hemoptysis out of a clear sky is always tubercular in origin, whether symptoms and signs are present or not. In 307 cases of hemoptysis from the records of the Massachusetts General Hospital, all of them presumably tubercular, 30 came out of a clear sky, with no preceding sign or symptom, no pain, no dyspnea, no loss in weight, and no râles. Twenty of these 30 were found to be clinical cases of pulmonary tuberculosis; 10 came to autopsy, and all but one, or 90%, proved to be tubercular. I would, however, call your attention to this one case that did not prove to be tubercular in this series, for it represents 10%, and I think it is well for us to realize that there are perhaps other such cases as this one, in which any of us may at any time err in the matter of diagnosis.

I am very frank to state that, for one, I do not believe that every case of hemoptysis, with or without preceding signs or symptoms, is of necessity tubercular in origin, but that rather we should make every effort to make the diagnosis regardless of this symptom, and not let it cloud the issue, as it generally does. It would perhaps be well to mention the condi-

tions which may cause hemoptysis out of a clear sky, as well as tuberculosis, and there are many as Lord<sup>15</sup> gives them: 1, syphilis; 2, non-tubercular suppurations, abscess or gangrene; 3, echinococcus; 4, pneumonia; 5, pulmonary infarction; 6, aneurysm; 7, new growth. Lawson Brown,<sup>16</sup> in discussing Lord's paper made the statement that it was his opinion that every case of pulmonary hemorrhage should be considered as tubercular in origin until proved otherwise. There has been much discussion recently as to whether or not pulmonary hemorrhage may follow high blood pressure; it is believed by some that it is possible. I have never seen a case of hemoptysis due to this cause.

**Pleurisy.** Pleurisy with effusion has for many years been considered as always tubercular in origin by many, and of late the feeling seems to be growing that dry pleurisy should also be classed as tubercular until proved otherwise. I agree with this feeling, for every case of dry pleurisy that I have seen in the last five or six years has proven later to be tubercular.

**Sputum.** The question whether or not a person suffering from pulmonary tuberculosis should raise sputum or should not has been a source of controversy for many years, and there are those who still contend that it is necessary for sputum to be raised during the process of early active tuberculosis. The question of whether positive bacillary findings in the sputum are absolutely necessary before making a positive clinical diagnosis would seem to be too old for discussion, but that there are still many men who demand and insist upon tubercle bacilli being demonstrated before arriving at definite conclusions, though regrettable, is a fact. I believe that it is just as possible to make a definite diagnosis with a negative sputum as it is with a positive sputum, and a study of the records of the many State sanatoria would bear me out when I say that there are many patients in them, who do not show constant sputum findings, and there are many who, throughout the course of the disease, never give a positive sputum. In explanation of many of these cases, I would again bring to your attention Heise's<sup>11</sup> remarks regarding the two types of tuberculosis,—peribronchial and parenchymatous. In the former, tubercle bacilli were found in only 3%; in the latter, 47%.

**Temperature.** The last symptom considered in this third group has been described as under symptoms due to the tubercle toxin.

When any one of the first three symptoms found in this group, particularly if accompanied by one or more symptoms of this or either of the other groups, especially with elevation of the temperature curve occurs, we have strong presumptive evidence of clinical tuberculosis, whether any further evidence can be found or not, and with the manifestation of a positive tubercular reaction, we feel that we



are absolutely justified in making a diagnosis of active tuberculosis.

**Tuberculin.** A few words as to the use of tuberculin in the diagnosis of pulmonary tuberculosis. I am not quite in agreement with Lord,<sup>22</sup> who, speaking of the use of tuberculin subcutaneously, says, "I have been loath to use this test except as a last resort in diagnosis." Personally, I believe that tuberculin should be used to a wider extent in helping us to arrive at our diagnosis.

I believe, however, that it should always be used by one skilled in its use or under his personal direction, and not by the general practitioner, who at best understands its action so imperfectly. It would seem that needless chances are taken in administering large initial doses. An initial dose of from 1/10 to 1/2 milligram seems sufficient, with a gradual increase to 10 milligrams, increasing the dose every two or three days with the patient at absolute rest and taking a three-hour temperature chart.

Given certain symptoms in either of the three groups as mentioned by Pottenger,<sup>12</sup> with indefinite physical signs or none at all, I think that tuberculin injection is justified in many cases. If a positive result is obtained, its value depends upon the size of the dose to which the tissues responded. The smaller the dose required for temperature elevation, the greater evidence in favor of active disease.

Rivière,<sup>14</sup> speaking of tuberculin, says, "For each tuberculin test is compounded of many elements, some of which are of value, while others may be comparatively useless." Of the von Pirquet reaction he says, "No one, to take a concrete example, can in these days rely upon a positive von Pirquet reaction as evidence of active tuberculosis in the adult, and retain our respect for his intelligence; the vast mountain of fact is against him." I agree heartily with this characterization of the above, for from my own personal experience, I have found it of no value in adults, but of much in infancy.

**X-ray.** The value of the x-ray findings in the study of lesions of the pulmonary tract is a source of much controversy, and will always remain so. On the one hand, are those who maintain that it is possible to make a diagnosis of active pulmonary tuberculosis in the so-called incipient stage by means of the x-ray, in the absolute absence of any signs or symptoms; on the other hand are those who maintain that the value of the x-ray in the diagnosis of tuberculosis is negligible, and it is only as corroborative evidence that it is worthy of consideration. Between these two differing views, there are, of course, many men who lean to ward the one and toward the other.

Baetjer,<sup>17</sup> in a very sane paper on the "Early Diagnosis of Pulmonary Disease by the X-ray," read at the annual meeting of the National Association, said, "We cannot as yet

make a diagnosis between active and inactive tuberculosis, and, in my opinion, it is not advisable to send a patient away solely on the x-ray diagnosis." It was also his opinion that the radiogram could not make the diagnosis of early tuberculosis in the absence of signs or symptoms.

Minor<sup>18</sup> of Asheville summed up the situation very well when he said that, "Only in conjunction with physical signs or constitutional symptoms is a positive x-ray plate of any value, and in my opinion it is never wise or advisable to stand upon the x-ray findings alone." My personal opinion is that the value of the x-ray rests upon its use in corroborating the positive clinical diagnosis made by the clinician, and that it should be used in this way only.

This paper would be incomplete without some mention of the physical signs produced by the invasion of the lung structure by the tubercle bacilli. It has been well said that this bacillus is ubiquitous in every way, and in no more striking a manner than in the diversity of pathological lesions produced within the chest cavity. It is not my intention, nor within the scope of this paper, to take up your time with a discussion of the pathological conditions following its entrance, with which you are all acquainted. Perhaps the most important physical signs are the r le, localized or diffuse, dullness over the chest wall, and signs of consolidation, with transmitted voice sounds. Lawrason Brown<sup>19</sup> says, "The importance of physical examination in the diagnosis of pulmonary tuberculosis has been over-emphasized, and symptoms are a better and a more accurate guide to activity than physical signs." He also says, "Symptoms without physical signs demand treatment, while physical signs without symptoms require careful watching." I do not think the case could have been better put, and I agree with his opinion in this matter.

It does not seem to me that it is possible for physical signs due to the tubercle bacilli to exist in the lungs without definite symptoms, but I emphatically believe that the reverse is possible. I am sure, in my own opinion at least, that the tubercle bacilli may invade the lung tissue, producing certain changes productive of symptoms, such as given by Pottenger<sup>12</sup> in the first or second group, but without demonstrable physical signs. I am always exceedingly suspicious of a chest which shows dullness with r les, but in which the patient has no symptoms, suspicious that it is something other than tuberculosis. I cannot agree with him who demands a r le or dullness before making the diagnosis in the presence of a clear history of contagion and some symptoms, but I do agree with anyone who, in the presence of moderate or marked dullness, r le and cough, attacks of fever, but with no other physical signs, demands further study.

Bray<sup>20</sup> in a paper read at the annual meeting of the



that the râle is a very constant sign in incipient tuberculosis, and among the early physical signs the pulmonary râle is the one definite sign, the others merely represent deviations from the normal and, at most, are indefinite. He says that râles are latent in approximately 75% of early cases, and 30% of the moderately advanced; that localized apical râles are almost pathognomonic, other conditions that produce them being of rare occurrence. Glover<sup>21</sup> compares the various methods of diagnosis in tuberculosis of the lungs, particularly in regard to the distinction of active processes from inactive. Clinically, he attaches most weight to the presence or absence of râles, their absence, in his opinion, in repeated examinations excluding an active process. Rivière<sup>14</sup>, on the other hand, says that it is a common error to believe that small medium râles heard at one or both apices suffice for the diagnosis of phthisis. In practice this sign is frequently found in catarrh of all varieties of causation, and unless the râles are consonating, or there is an accompanying loss of percussion resonance, there is no justification for any diagnosis beyond that of catarrh.

I agree entirely with Bray<sup>20</sup> in his statement as to the value of the localized apical râle in the diagnosis of this condition and it seems to me that his figures are conservative and accurate so far as my personal observations, in that râles are latent, go. Let us always remember that the simple expedient of employing cough during the examination will bring these râles out. In the words of the elder Janeway (Bray), "Invariably employ cough to elicit râle in tuberculosis." However, notwithstanding my belief in the value of the latent râle, I still think it is unnecessary to insist upon its presence in all early cases or moderately advanced ones any more than I insist upon the presence of bacilli in the sputum. From my own personal experience, I know that it is possible for moderate or whispered dulness to exist without a râle, either before or after cough, and, taken in conjunction with history and constitutional symptoms, to mean but one thing,—pulmonary tuberculosis.

Just a few words as to breath sounds and voice sounds. Rivière<sup>14</sup> covers the ground exactly, I think, when he says that, "Voice sounds, and especially whispered voice sounds, should be compared with that derived from the breath sounds. As a rule, these signs cling together."

From the above discussion of the symptoms and signs of tuberculosis studied from the etiological standpoint, we can see, I am sure, that, if properly analyzed, they give us much diagnostic evidence. Those of the third group, due to the tuberculous process *per se*, are, of course, the most valuable. A history of frequent and protracted colds or hemoptysis or pleurisy, wet or dry, with a temperature curve, should cause us to investigate, always with an open mind. Alone, I am firmly convinced that the symptoms in the first and second groups do not defi-

nately mean tuberculosis. Associated with one or several of those of the third group, they are certainly worthy of the most serious and painstaking investigation. I confess that it is impossible for me to outline any sort of a symptom-complex or symptom-complexes to fit every suspected case: all I can say is that, in my opinion, it is ever necessary for each patient to be regarded as a distinct and separate one, analyzing the history, the constitutional symptoms and physical signs broadly and not permitting ourselves to be carried away by the presence of one or two signs or symptoms that may have been present in other patients in whom diagnosis of tuberculosis was proved. That there are certain symptoms that alone are of the greatest importance and value I freely admit. I cannot, however, bring myself to agree with the dictum that a patient be labelled for life as tubercular on such slender grounds as one symptom.

#### CONCLUSIONS.

In conclusion I should like rather briefly to review several of the points brought out in this paper and the convictions which I hold concerning them.

*In the first place*, I wish to emphasize again the belief that it is not only in the beginning cases of tuberculosis that we err in our diagnosis, but just as much in the diagnosis of the moderately advanced and advanced cases. I would urge you to consider the percentages of wrong diagnoses as cited by Ash<sup>6</sup> and the fact that during only the past year a matter of 1.6% of the individuals entering our State sanatoria were either non-tubercular or not diagnosed. Our responsibility is just as great in the diagnosis of the patient presenting with what seem to us all the necessary signs and symptoms for the diagnosis of advanced tuberculosis and I would urge upon you the necessity of approaching the examination in these cases with a mind as free and unprejudiced by the history of cough or hemoptysis as is possible, remembering that almost any pathological condition in the pulmonary tract may simulate tuberculosis in every respect.

*Secondly*, that Pottenger<sup>12</sup> in suggesting the consideration of the symptomatology from the etiological viewpoint has indeed made it easier to analyze the disease conditions.

*Thirdly*, that I feel from my own experience that Lawrason Brown,<sup>19</sup> and others more competent than I, are correct when they say that the importance of physical examination in the diagnosis of pulmonary tuberculosis has been over-emphasized in that symptoms are a better and a more accurate guide to activity than physical signs; that symptoms without physical signs demand treatment; that physical signs without symptoms require only careful watching. With symptoms and a history but no physical signs, I feel that we can make a diagnosis in the large



majority of cases; with physical signs but no symptoms, I feel that it is impossible.

Finally, it does not seem possible or probable that we can ever outline a symptom-complex of certain signs and certain symptoms and say that these signs and these symptoms in every suspicious case mean tuberculosis. It is rather my feeling that we must value each symptom and each sign for itself and in conjunction with other symptoms and other signs, for every case is a different one and has a different complex; and though deeming that certain outstanding symptoms, such as hemoptysis, cough, elevated temperature, increased pulse, and emaciation are suspicious of infection, I do not feel that we are qualified to say that this is a case of active clinical tuberculosis in an adult without proper and due consideration of the other factors present.

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## DISCUSSION.

DR. HENRY D. CHADWICK, Westfield: I agree in the main with the statements in Dr. Schadt's paper, but I must take exception to some of his conclusions. I think he has very little basis for his conviction that as many patients are given an erroneous diagnosis of tuberculosis as there are positive cases that are wrongly told that

they are free from that disease. I do not think that the time has come that we can justly criticize physicians for their errors in that direction and do not see that he has produced sufficient evidence to support his contention.

The State sanatoria last year admitted 1629 patients, whom the physicians of the state had diagnosed as having pulmonary tuberculosis. Out of that number 12 were found, after prolonged observation and tests, to be non-tuberculous. That is only about .74% of error. Of the 2000 cases admitted to Westfield since 1910, 23 have been found non-tuberculous, or about 1%.

In what disease with which internal medicine has to deal can a better showing be made? To my mind that is a splendid record and the physicians of the state are to be commended for their accurate diagnosis of a disease which presents so many difficulties.

In connection with the 11½% of non-tuberculous cases found at autopsy by Dr. Ashe of Mattapan, I think the following quotation from his paper should also be taken into consideration. "It is not to be supposed that the same percentage of error extends to all cases that have been treated in the hospital. It would be lowered by those cases of undoubted tuberculosis that have been discharged otherwise than dead; and further, greater effort has been made to obtain permission for necropsy in those cases of special interest, among which have been a majority of the non-tuberculous. Furthermore, in eight of these cases tubercle bacilli have been found and the diagnosis had been made largely on this basis, in spite of any doubt that had previously existed as to the true nature of the case."

He states—and I agree with him—that when a diagnosis is doubtful, especially if the patient is in an institution, several sputum examinations should be made, and not put complete confidence in one positive finding. There are possible sources of error in labelling specimens and recording the findings, and also occasionally patients, to prevent discharge, will borrow specimens of sputum from a positive but generous neighbor.

Granting that a few patients are sent to a sanatorium under a mistaken diagnosis, the harm done, if any, is not to be compared to the fatal experience of too long delay while waiting for conditions to develop so far that the patient himself is able to decide that he has consumption. In doubtful cases I think patients should be sent to a sanatorium for diagnosis. These institutions should be used as clearing houses. Even if found negative, a patient's stay in such a hospital can do no harm and may be beneficial. If the diagnosis can be cleared up in this way great good results to the patient. Are not patients frequently sent to a general hospital under a wrong diagnosis? Of course accuracy in diagnosis is to be desired in all cases, but do not carry it to the point of putting the patient's life



in jeopardy by delaying until all positive signs are obvious. There would be fewer abdominal operations, but many more deaths, if surgeons waited for conditions to develop until a diagnosis was sure. Symptoms and physical signs are to be considered together in making a diagnosis. Physical signs do not distinguish the healed or latent lesions from one that is active. Symptoms, on the other hand, indicate the activity of the process and are to be considered almost exclusively in prescribing treatment. It is not necessary to send a patient away for treatment even when he has extensive physical signs if he had no symptoms of active tuberculosis. This should always be borne in mind when consulted by an ex-sanatorium patient, as not infrequently they are returned to sanatoria unnecessarily because of physical signs, but present no evidence of activity. If symptoms are present and physical signs cannot be made out, watch the case closely and without much delay consult with a specialist in chest diseases, whose better trained ear may be able to find a lesion before it has increased in activity or extent.

**Hemoptysis.**—This has been the initial symptom in 5% of the 1000 cases admitted to Westfield. I regard it, when present, as the most reliable of all the many symptoms of active tuberculosis. Don't give such a patient a sense of false security by saying the blood probably came from the throat unless you can prove that it does by finding the bleeding point. There will be fewer errors in diagnosis in such cases if, after excluding pneumonia, a positive diagnosis of pulmonary tuberculosis is made. Our percentage of arrested cases among those whose initial symptom was hemoptysis was equal to those having other symptoms at the onset.

Personal history is of the utmost importance, but the family history is of much less value, and especially is this the case with adults. Our records show that of 194 children under 14 years, 67% had a positive family history; in 209 patients from 14 to 20 years, it was positive in 44%; 815 patients over 20 years of age show but 34% with positive family history; therefore, it would seem to help but little in the consideration of the individual case.

Diagnosis should not be made on one symptom, but don't wait for them all. Neither form your conclusions on one pathological, physical sign, but don't wait for too many to develop. Consider all the evidence, giving the greatest weight to symptoms, exclude other possible diseases as far as you can, and then it is best to consider the case one of tuberculosis, and suitable treatment should be at once begun.

**DR. E. O. OTIS, BOSTON:** Those of us who are doing more or less special work in tuberculosis here in Boston frequently see and examine one another's patients as they go from one to another, and, as well, those who have consulted one or more dispensaries or out-patient departments. Sometimes we agree with the diagnosis

made by our brother physicians, or at the dispensary or hospital, and sometimes we disagree; which goes to show, it seems to me, that it is extremely difficult in at least a certain number of cases to make a definite diagnosis upon one examination. The only thing we can do is to keep the patient under observation until further evidence is obtained.

In teaching the subject of tuberculosis I have found that the tendency of the student is to place undue value upon slight physical signs, such as slight or doubtful dulness and slight modifications of the respiration. This is not infrequently the case with the practitioner. We need more than indefinite physical signs in order to make a definite diagnosis. We must have definite symptoms of an active disease. One must bear in mind the difference between clinical and anatomical tuberculosis. In the latter case, whatever the physical signs, if there are no symptoms and the patient is not ill, he requires no treatment; while in the former, if we have the characteristic symptoms and the patient is ill, whether we can detect definite physical signs or not, the case is one of clinical tuberculosis and should be treated as such.

With regard to hemoptysis, I believe we should regard this as almost a pathognomonic symptom with rare exceptions. It is true that one occasionally meets with cases of hemoptysis where there are no other symptoms or none subsequently develop.

I agree with Dr. Chadwick that more importance should be placed upon the personal history of the patient than upon the family history. In my experience I have found the former more valuable.

With regard to râles. As we all know there can be almost any amount of infiltration without evidence of moisture, indicated by râles. If, however, we find at an apex persistent fine râles it is one of the most, if not the most important of the physical signs we have, although it may not be the earliest sign. Here again, however, one ought not to make a diagnosis upon a single physical sign, even râles. We must have at the same time enough of the characteristic symptoms to complete the evidence in favor of tuberculosis—but with the râles and symptoms a positive diagnosis can generally be made. After all, there are not a few border line cases, which are not infrequently sent away, to the disarrangement of the family life, which, in my opinion, had better be kept under observation at home until more definite evidence is obtained. We have been insisting so persistently upon making an early diagnosis that the pendulum seems to have swung the other way and I have found with increasing frequency that the diagnosis of tuberculosis has been made and been reported upon what has seemed to me insufficient evidence.

**DR. GEORGE L. SCHADT, Springfield:** In regard to hemoptysis, I would not wish to be



understood as saying that in my opinion hemoptysis is not a very important symptom in early tuberculosis. My feeling, however, is that we should not let hemoptysis or any one symptom prejudice our minds to such an extent that we are willing to label an individual as tuberculous. It has been my experience in the last two or three years to see a number of individuals who have had pulmonary hemorrhages, apparently coming out of a clear sky, with no other symptoms following—no lesions, no temperature, no pulse—and every one of them has apparently recovered from whatever condition caused their hemorrhage. I am willing to admit, it might have been tuberculosis, but my feeling is still that we are not justified in labelling a person tuberculous on that one symptom with absolutely nothing else.

I must disagree with Dr. Chadwick when he says that it is his opinion that every case of suspected tuberculosis should be sent to the sanatorium for diagnosis. I disagree very strongly there. I do not think that you can make a comparison between the sending of a patient suspected of having tuberculosis to a sanatorium for diagnosis and the person suspected of having appendicitis to a general hospital. We look at it from different standpoints—he from the sanatorium point of view, I from the viewpoint of the practicing physician who comes in contact with the individual and with his family, and with the circumstances that ensue. It is the practicing or family physician who sees the after-results or opprobrium that comes to a person with a history of having been at a State sanatorium for tuberculosis whether he had the disease or whether he had not. I do not wish to go into the economic question; but I think it is little realized by the specialist, particularly by the sanatorium man, how much a history of having been an inmate in a State sanatorium for tuberculosis means to the individual in after-life.

Dr. Chadwick mentions 2000 cases admitted to the Westfield Sanatorium since its opening. In 23 of these there was found to be no tuberculosis, a little over one per cent. I think this is too much. I believe that we should not err even to one per cent. in the diagnosis of tuberculosis. I believe that by the proper correlation of our symptoms and our signs and our histories, personal and family, with the use of tuberculin, we could in pretty nearly every case make a definite diagnosis.

Dr. Otis emphasizes one of the points that I tried to make when he said that in his teaching he had learned a good many things: one thing commonest, that students are apt to over-emphasize certain points. I would emphasize that they are also apt to do carry these ideas into practice. That is over-emphasizing certain symptoms indicating the probable presence of tuberculous infection, but not necessarily tuberculous disease. I have seen these men come into practice, and with a history of cough or a history of

hemoptysis they have seen an indication of tuberculosis and nothing but tuberculosis. If a patient presents himself in the office and complains that he has had a cough for two or three weeks, or that he has expectorated a little blood, he is looked upon with the idea that tuberculosis must be found in him and not with the idea of simply forgetting the signs of hemoptysis, forgetting the cough and looking at the case in an intelligent manner, endeavoring to make a diagnosis with these symptoms as an aid and not because of the mere presence of these symptoms and nothing else.

## Medical Progress.

### ELEVENTH REPORT OF PROGRESS IN ORTHOPAEDIC SURGERY\*

By ROBERT B. OSGOOD, M.D., ROBERT SOUTTER, M.D.,  
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#### TUBERCULOSIS.

ELY,<sup>1</sup> reviewing his results obtained in a series of experiments on eleven rabbits and six guinea pigs, concludes that "the lymphoid marrow of rabbit's bones is a good field for the growth of bovine tubercle bacilli, and that the lymphoid marrow of guinea pigs' bones is a good field for the growth of human tubercle bacilli."

These results would seem to cast doubt upon the correctness of Fraser's<sup>2</sup> dictum that red bone marrow is practically immune to tuberculosis.

Manning and Knott<sup>3</sup> have sought by means of the von Pirquet reaction to determine the percentage of children suffering from tuberculosis and living in known tuberculous families, contrasted with the percentage in children living under apparently favorable conditions. Of the first group (166), 50% gave a positive reaction. In the latter group only 22%. In the whole number (232), only 42% reacted to the test, which is a very much lower percentage than von Pirquet's figures, which were 93% in children of about the same age. The average percentage of positive reactions among fourteen observers who have studied large series of cases was 75%.

Wolcott<sup>4</sup> analyzes the results in 682 cases of Pott's disease in which an operation had been performed, the purpose of which operation was to ankylose the spine at the seat of the disease. On 642 cases either the bone graft, after the method of Albee, or the plastic bone operation,

\* This Report is based on a series of papers presented at the annual meeting of the American Orthopaedic Association, held at the Hotel Marlborough, Boston, March 1916. The papers are given only in outline, but the full text of each paper is available for reference and comment.



after the method of Hibbs, had been performed. In 198 cases, done by Albee himself, he has reported 92% as improved. In 158 cases done by Hibbs himself 90% were reported improved, and in 286 cases done by other surgeons there was improvement in 73%. In the whole series there were thirty deaths, or a mortality of about 5%. Three cases developed paraplegia after the operation, five cases developed abscess; there were nine cases of sepsis, and in seven there was necrosis of the graft. Tuberculous meningitis developed in seven and miliary tuberculosis in three. The conclusions of the author are: 1. The operation may be expected to abbreviate treatment and hasten ankylosis. 2. By hastening ankylosis the tendency to deformity is lessened. 3. The operations are best adapted for caries involving the cervico-dorsal, dorsal, and dorso-lumbar regions,—parts of the spine in which limited motion is of little consequence. It is less well adapted for caries involving the cervical and lumbar regions, parts in which limited motion is a detriment. 4. The general opinion of the majority of surgeons is that the operation should be considered only as one phase of the treatment for Pott's disease and that post-operative support should be continued until all signs of active disease have disappeared.

[Ed. Note.—With these conclusions the Editors find themselves in essential agreement. We are sorry that there has not been a more careful analysis of the relative value of the two operations in hands other than the originators of the two methods. Our own impression is that in the early cases with small kyphoses, the bone graft operation of Albee is likely to yield as good results as the plastic bone operation of Hibbs. It is an operation which requires less skill and its technic can be more easily acquired. It can be done more quickly and, especially if the motor saw is used, need induce little shock. If the kyphos is of considerable size, the bone graft operation is more difficult, and the cutting of a simple curved graft or the applying of a series of long, thin, bendable bone splints, consumes time and adds complexities. In spite of contention to the contrary, these grafts cannot in our experience be expected to lessen materially the size of the kyphos. The Hibbs plastic operation, on the other hand, does lessen the apparent size of the kyphos, and where complicated grafts would be necessary, can be done almost as quickly and, we believe, with as reasonable an expectation of ankylosis. In Dr. Hibbs' hands or in the hands of those who have taken the pains to develop a technic, there seems to be no more shock than in the bone graft operation. We attach great importance to the detail of the technic in order to obtain satisfactory results. We still feel doubtful concerning the wisdom of these operations under four to five years unless it is impossible to provide recumbency followed by am-

bulatory apparatus. We feel thus doubtful because the results of carefully carried-out conservative treatment are usually so good and because, with soft bones and rapid growth, we should feel that recumbent and protective treatment ought to be continued even after an ankylosing operation for a period approximately as long as that required in an ordinary case for healing by nature, aided by bloodless art. A 5% mortality is gratifyingly low, but not negligible.]

#### ARTHRITIS AND BURSITIS.

##### *Hemophilic Joints.*

DuPan<sup>2</sup> relates that a boy of fifteen was brought to the hospital on account of a very painful tumor of the ankle, which seemed to be a sarcoma on the point of ulcerating, except that sarcomata are not, as a rule, so painful. The tibia was not tender, and although there were local heat and fever, yet there was no involvement of glands, no lymphangitis or fluctuation. A small incision brought dark blood, but no pus, and the little cut bled continuously for three days, confirming the final assumption of hemophilia. Under calcium chlorid and diphtheria antitoxin the oozing of blood was finally arrested. His family showed the usual skipping of the second generation and the re-appearance of the hemophilia in the sons of the daughters, three of the five sons being pronounced hemophiliacs. In treatment the main thing is to suspect the hemophilia instead of mistaking the joint trouble for acute articular rheumatism or a tuberculous process, as is too often done. Du Pan declares that this error in diagnosis has often proved fatal. He cites various cases in which puncture of the joint for supposed hydrarthrosis has caused bleeding to death. The blood accumulating in the joint causes sudden pain and swelling, and the limb is held as in acute rheumatism. The region feels hot and there may be fever, but the skin keeps its normal color. There are, as a rule, several successive attacks involving different joints, but mostly the knee or elbow, one at a time, with or without some slight local trauma preceding. The hemarthrosis may be entirely absorbed, but it usually persists and irritates the joint, resulting in chronic arthritis. In the second phase this arthritis resembles in every respect a white swelling; there is thickening of the synovia, impotence of the limb, and wasting of the muscles. The pain is less in this stage, the swelling becomes more general, and the culs-de-sac are distended, but local heat does not increase. There is elastic fluctuation in the synovial culs-de-sac, as with a tuberculous process, and partial ankylosis develops. After the inflammation has subsided, insidious destruction may continue, and there is never an abscess or fistula, and never any enlargement of glands, as from malignant disease. There is danger of



mistaking hematomata in muscles for cold abscesses and of the occurrence of fatal hemorrhage resulting from incisions. The family antecedents and tests of coagulating power of blood will reveal the tendency to hemophilia. The first manifestations generally appear before the age of two and the hemophilias generally outgrow the tendency by twenty-two. It rarely happens that a hemophilia succumbs to hemorrhage after twenty-two. The most threatening hemorrhages are during teething or at puberty. The skin covering a hematoma is stretched, shiny, and bluish or black, with a peripheral red zone. These hematomata never suppurate, but the blood coagulated in them may undergo calcareous infiltration. The literature on hemophilia and the theories as to its mechanism are discussed in detail. Horse serum thus far has proved more effectual than anything else in the treatment of hemophilic cases, but its action is only transient.

### *Bursitis.*

Riedel<sup>6</sup> has made a study of an hygromatous affection of the bursa beneath the insertion of the semimembranosus tendon. The bursa does not as a rule communicate with the knee joint, but is separated from it by only a very thin membrane. From some unknown cause a serous or somewhat gelatinous exudate sometimes develops in this bursa, but this exudate is never as thick as the exudate of a tuberculous ganglion. Riedel estimates that in about one-third of the cases the thin membrane separating the bursa from the joint is ruptured by the exudate, and a chronic hydrops of the true joint may be set up. Great care must be exercised in excising the bursa, if opening the true joint is to be avoided.

### PARALYSIS.

#### *Decalcification of Bones in Paralyzed Limbs.*

H. Claude and R. Porak<sup>7</sup> have studied the phenomenon of bone decalcification in cases of paralysis of the upper extremity occurring from various causes, *e.g.*, paralysis uncomplicated by neuritis, paralysis from wounds of the brachial plexus, paralysis from hysteria and disuse from simple immobilization. Their conclusions are in keeping with those of Legg<sup>8</sup> and others. They believe it cannot be regarded as pathognomonic of any nerve lesion, but that the mechanism of its production is identical with that which causes the wasting of muscles, hyperkeratosis, local sweating, etc., and attributable wholly and solely to disuse.

### *Poliomyelitis.*

Sawyer<sup>9</sup> made a study of several groups of cases of epidemic poliomyelitis appearing in Northern California in the summer and fall of 1913. In many of the cases reported the infection can be explained on the theory that epidemic poliomyelitis is transmitted through con-

tact from acute cases or carriers. The active virus of poliomyelitis was demonstrated by animal inoculation to be present in rectal washings obtained from a patient fourteen days after the beginning of the paralysis. Since the active virus may leave the body from the rectum, as well as from the nose and mouth, precautions should be taken in the care of the poliomyelitis patient to prevent infection, not only from the nasal and buccal discharges, but also from feces and soiled bedding.

Abramson,<sup>10</sup> as a result of his examination of the spinal fluid in 43 cases of poliomyelitis, believes that a study of the etiology helps to distinguish the abortive and paralytic cases. No special help is afforded by this examination in the way of preventive or early treatment. Abramson states that the findings are often compatible with either poliomyelitis or tubercular meningitis, and lays emphasis upon the importance of the clinical signs, sudden onset, high fever, etc., in establishing the diagnosis. Thus far a study of the spinal fluid seems to offer little help in prognosis.

Francisco's<sup>11</sup> article on the early management of poliomyelitis is valuable in that it shows the great need which still exists of public education as to what is rational in the treatment of infantile paralysis. He investigated the previous treatment of thirty cases which came to his clinic and found that this treatment had been based on every type of ignorant and false advice. Some of it was mere quackery, there were many inefficient ready-made braces, and there was absolute neglect of treatment in other cases as a result of advice which had been given that "nothing could be done." Nearly all these cases were capable of being helped by operations or braces, but the great importance of the prevention of deformity was evident.

Gallie,<sup>12</sup> in his second paper, based on the results of 100 operative cases, feels justified in recommending the method of tendon fixation which he has advocated in cases of certain foot deformities and paralysis following poliomyelitis. He has discovered that it is necessary to remove the sheath of the tendon thoroughly before burying it in the groove made in the bone, else there is the possibility that the fixation will not be complete, the tendon moving in the sheath despite the fixation of the sheath to the bone.

Hoke and Hodgson,<sup>13</sup> as a result of their studies of the disabilities following poliomyelitis, believe that while tendon fixation, and perhaps the artificial silk ligaments of Lange, have their place in the treatment of the paralytic members, no operation on the soft parts is ever sufficient to hold the limb in good static position unless the bony skeleton is properly balanced. They, therefore, advocate bone operations whenever there is deformity or malposition of bone which would interfere with proper function or proper weight bearing.



[Ed. Note.—While the Editors are ready to admit the wisdom of bone operation in selected cases, they have been impressed with the amount of correction which may be obtained by tendon transplantation, tenodesis, silk ligaments, etc. Future growth may, perhaps, be expected to take care of a slight residual deformity if the operation succeeds in so balancing the foot that the resulting forces are exerted in a correcting direction.]

Biesalski<sup>14</sup> has operated on 9 cases of Little's disease; 3 four years old; 4 two and a half years old, 1 one year, 1 six months old, thus having a fairly long time of observation. The age was  $5\frac{1}{2}$  to  $12\frac{1}{2}$ . He has operated only on the most severe cases, and emphasizes the importance of selecting only these cases for this operation, as otherwise the results might be credited to Foerster's operation, which could be obtained with much simpler methods. Biesalski describes the technic of the operation, which he always does in one session.

### *Hemiplegia.*

Franz, Scheetz, and Wilson<sup>15</sup> report the results of massage, active and passive movements, in restoring motor function in old-standing cases of hemiplegia. From their observations it would appear that very considerable restoration of function can be obtained in many cases of hemiplegia by appropriate and persistent treatment. Their subjects were not altogether favorable, in that in several instances mental as well as physical impairment existed.

[Ed. Note.—The Editors wish to record, as they have done in previous Reports of Progress, their conviction that too little attempt is being made to ameliorate the depressing condition of these hemiplegic cases. A "shock" is looked upon by the public as an immediate forerunner of dissolution, and the immediate results of the shock are supposed to be permanent. Physicians, of course, know that often these patients live many years, and may die of an intercurrent disease without ever having another evident cerebral hemorrhage, and that often also very considerable recovery takes place. The years these patients do live will be much happier and more useful years if the idea of the hopelessness of the condition is combated, and the idea of a possible return of function under appropriate treatment and individual effort is fostered.]

### *Tardy Paralysis.*

Ramsay Hunt<sup>16</sup> reports three cases of late paralysis due to chronic progressive ulnar neuritis, developing years after injuries to the elbow. These injuries had produced a valgus deformity and some change in the ulnar groove. The paralysis is apparently due to pressure irritation of the nerve. In one of his cases part of this pressure, at least, was due to a bursal cyst developing in the groove beneath the nerve. Excision of this cyst brought relief of the paraly-

sis. The necessity of differentiating this condition from the progressive spinal atrophies is obvious.

### BONE AND JOINT SURGERY.

Haas<sup>17</sup> has carried out a series of 75 experimental transplantations of the epiphysis. These consisted of eleven transplantations of an entire metacarpal or metatarsal, ten autotransplantations of the same, four reimplantations of split metacarpal or metatarsal, two autotransplantations of the same, six reimplantations of the epiphyseal cartilage, seven autotransplantations of the same, twelve reimplantations of varying lengths of the epiphyseal end of the metacarpal and metatarsal bones, twelve autotransplantations of the same, and ten two-stage autotransplantations of the same. The author draws the following general conclusions: 1. From the practically uniform failure of increase in length of the bones after transplantation of the epiphyseal cartilage, either alone or with an accompanying piece of the epiphysis and diaphysis, both in reimplantation and autotransplantation, it must be concluded that epiphyseal cartilage loses its power to function after such transplantations. 2. As the degenerative processes were more advanced in autotransplantation than in reimplantation, it can be almost certainly predicted that there would be a more marked degeneration in homotransplantation. 3. Whether a small- or large-sized transplant was taken was of no consequence, as there was the same failure of growth in every instance. Incision into the periosteum or boring holes into the cortex hastened the degenerative process. 4. There was marked disturbance of growth following the two-stage autotransplantation, in spite of the fact that osseous union was secured before severing the epiphyseal transplant from its surrounding and nourishing tissues. 5. The epiphyseal cartilage must be considered as a very vulnerable tissue, its viability being directly dependent upon its blood supply.

### *Bone Transplantation.*

Horak<sup>18</sup> reports two cases of extensive osteoplasty of the humerus after removal of bone for sarcoma. In the first case the upper two-thirds were removed and a piece of the humerus of a seventeen-year-old girl, who had died from a gunshot wound in the head, substituted for the resected portion. The result was fairly good; the patient became able to move the shoulder up to the horizontal line, and to use the arm for eating and sewing. In another case the lower part of the diaphysis of the humerus was removed and a piece from the humerus of a young man who had died also from a gunshot wound in the head was implanted. Four days after the operation the patient showed symptoms of tetanus, from which he died. Tetanus bacilli were found in the marrow of the trans-



planted bone. This unfortunate occurrence makes evident the necessity for a most careful bacteriological examination of the blood and bone marrow in all homeoplastic operations in which the transplant has not been boiled. Küttner has already pointed out the importance of such examination.

Williams<sup>19</sup> reports an interesting case in which a giant cell sarcoma occurred in a man 27 years old, and 2½ inches of the lower end of the radius were excised. Two days later they obtained from a suicide the lower end of the radius, which was boiled an hour and kept in sterile salt solution for four days. This graft was applied and primary union took place. Subsequent x-rays showed the hand radially abducted and dislocation of the ulna. The function was poor and the hand grasps weak. The graft seemed to have acquired definite contact with the living bone.

[Ed. Note.—We have noticed this deformity and lack of good function in certain cases where similar operations have been done.]

#### *Subperiosteal Resection in Osteomyelitis.*

In a series of experiments in dogs, Phemister<sup>20</sup> finds that in young animals after subperiosteal resection of the shafts of the same bones that are most commonly affected by osteomyelitis in man, for example, the tibia and the humerus, there is usually a complete regeneration of the shaft. From his study of the specimens subsequently removed, it seems that the periosteum plays a certain part (osteogenetically) in the formation of the new bone, though the particles of bone remaining adherent to the periosteum after the removal of the shaft play a part also. In old dogs after subperiosteal resection, using the same technique, there was almost invariably failure of regeneration. Infection even in young animals greatly delayed or prevented the regeneration. Clinically, also, he finds that age is an important factor. He considers that "in view of the clinical and experimental data now at hand, showing the frequent failure of regeneration, subperiosteal resection should be reserved for selected cases of osteomyelitis in which there has been extensive necrosis of bone and particularly where this necrosis is located in areas inaccessible to operation, such as the posterior part of the tibia. Its use should be limited to parts of the body in which there is some other bony support (a so-called 'splinting' bone) and should almost never be used where there is only one bone in the extremity, as late sequestrectomy gives better results in such cases." The operation should not be performed too early, while the infection is severe, nor before a soft involucrum has formed. On the other hand, it should not be performed too late, after the involucrum is so ossified that an insufficient amount of osteogenetic tissue remains.

#### *Excision of Transverse Process of Fifth Lumbar Vertebra.*

Fassett<sup>21</sup> reports three cases in which an excision was done after other methods, such as fixation in various ways, had been tried. In these cases he exposed the process, either by direct incision through the erector spinae muscle or by a curved incision, turning back skin and muscle flaps toward the mid line. Removal was done by blunt dissection and chisel. Very material improvement resulted in all three cases. In one of these three cases symptoms developed on the other side subsequently, and the transverse process was removed on that side, but too little time had elapsed to admit of any conclusions. From these cases, and from others reported, it would seem that excision of the transverse process of the 5th lumbar must be considered in certain persistently painful backs of the type described.

Clarke<sup>22</sup> records an interesting case in which expert roentgenological interpretation had diagnosed a malignant sarcoma of the femur, but in which at the time of operation he was induced by the macroscopic appearance of the neoplasm, which suggested a "fibrous cyst," to withhold radical measures. After removal of the growth he approximated the parts with a bone graft and a long Lane plate. Subsequent pathological study confirmed the wisdom of his judgment.

[Ed. Note.—As Clarke says, it is most difficult at times to determine from the x-ray whether to call a bone tumor a cyst or a giant celled sarcoma, and the question we believe is still open as to just how many giant cells make it a sarcoma and just how definite a cavity must exist to call it a bone cyst. The "enraptured jelly" material and the many crossing and irregular trabeculae belong to more serious so-called giant celled sarcoma. As Bloodgood has shown, neither condition is malignant in the sense of metastasis. Both are usually capable of cure by local extirpation, and there is strong evidence to prove that many bone cysts "cure themselves," especially if they are broken, and certain evidence to suggest that occasionally an apparently typical giant celled sarcoma may disappear without radical excision. Fortunately, periosteal sarcomata are usually easy to differentiate in the x-ray from the less malignant form, but Clarke's article certainly emphasizes the necessity of most careful investigation as to the malignancy of bone tumors before amputations are performed, especially since the percentage of recurrences in the periosteal sarcomata is so high, even after most radical procedures.

#### *Pseudarthrosis of the Forearm.*

Novik-Jossorand<sup>23</sup> has observed that pseudarthrosis of the forearm does not as a rule occur when both bones are treated by the same method, most common in compound fractures of the radius or the ulna alone, but less frequent in



The author considers the separation between the ends of the bone the cause of non-union, and where the gap is less than 4 cm. recommends shortening the intact bone by an oblique cut, and thoroughly freeing and freshening the ends of the non-united bone and bringing them into apposition.

#### *Irrigation of Joints.*

Churchman,<sup>24</sup> after laboratory experimentation, has developed a technic by which joints may be irrigated thoroughly and repeatedly under local anesthesia. His apparatus, which consists of a series of aspiration bottles, is described, and he believes that he has benefited thus a few cases of tuberculous and Neisser joints.

#### RICKETS.

Baumann<sup>25</sup> describes a case of so-called myopathia rachitica, an affection of the muscles in rickets, which has been known since 1904 through the studies of Hagenbach-Bueckhardt, but which has not found very common consideration in literature. The case of Baumann's was a child of about three months, with typical signs of rickets. There was thickening of the epiphysis in both forearms, and both arms were paretic; there were no motions noticeable in the left hand, and only very weak and slow motion in the right hand. There was hyperextension of the elbow. When the arms were elevated, they fell down as though paralyzed, but fell in a more retarded manner. The muscles seemed to be tender. The electrical examination showed very considerable decrease in the electrical irritability by the faradic, as well as the galvanic current, but the changes were only quantitative and not qualitative. Under physical therapy the conditions improved. Indeed, it has been stated that physical therapy is of such benefit in these cases that the affection of muscles is often cured before there is any apparent change in the bony signs. Baumann presents illustrations of histological findings of another case, which show a very indistinct structure of the muscle fibres. In severe cases the cross stripes are particularly indistinct, while the longitudinal stripes are still seen. The kernels are enormously augmented in number. The differential diagnoses must include: 1. Acute polymyositis. 2. Polyneuritis. 3. Paralysis following acute infectious diseases. 4. Antero-polio-myelitis. 5. Myotonia congenita. 6. Secondary muscular atrophy. 7. Idiocy and myxedema.

(To be continued.)

PROGRESS OF POLIO-MYELITIS EPIDEMICS.—On August 25 the number of cases in the New York epidemic of poliomyelitis reached a total of 7,621, with 1,785 deaths. In Massachusetts on that date, the total number of cases since August 1st was 203, of which 38 have been in Boston. There have been 328 cases in this State since January 1, 1916.

## Book Reviews.

*Emergency Surgery.* By JOHN W. SLUSS, A.M., M.D., Associate Professor of Surgery, Indiana University School of Medicine; Ex-Superintendent Indianapolis City Hospital; Surgeon to the City Hospital. Third edition, revised and enlarged with 685 illustrations, some of which are printed in colors. Philadelphia: P. Blakiston's Son & Co. 1915.

This is a small book of 800 pages, well bound, well printed and illustrated. In the preface to this third edition, the author remarks that he has "adhered to the aim of former editions to present general principles concisely, and practical details amply—in short to make a book useful to the general practitioner in the surgical phase of his daily routine." Besides a careful general revision, the subject matter of Fractures has in this new edition been increased—and War Surgery rewritten. The book seems to be a good compilation of standard works, without bibliography. It has, in common with similar books, a tendency to help the untrained general practitioner to believe that surgery is really easy and may be done safely by almost any doctor. It is an open question whether such books do more harm than good, especially when, like this one, they are attractive in appearance and dogmatic in statement.

*Practical Cystoscopy and the Diagnosis of Surgical Diseases of the Kidneys and Urinary Bladder.* By PAUL M. PILCHER, M.D., Consulting Surgeon to the Eastern Long Island Hospital. Second edition, thoroughly revised and enlarged. Octavo of 504 pages, with 299 illustrations, 29 in colors. Philadelphia and London: W. B. Saunders Company. 1915.

The first edition of this book was published four years ago. The demand for a new edition has brought out the present volume,—a book twenty-five per cent. larger than its predecessor, thoroughly revised, and brought up to date by the rewriting of several chapters, notably those on "Diseases of the Prostate" and on "Functional Activity of the Kidneys." A new section of twenty-five pages on Pyelography has been added. The final chapters of the book, devoted to "Therapeutic Uses of the Cystoscope" have been greatly amplified. They contain among other new work, a detailed description of the use of the high frequency current in the treatment of bladder tumors.

The publishers have maintained the high standard of paper, type and illustration which made the first edition so attractive, and the book continues to be, as was its first edition, an example for other writers to follow.



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## THE LATEST THING IN CRUTCHES.

NECESSITY is the mother of invention and war is the mother of necessity. Therefore, war is the grandmother of invention and certainly the present war has seen a great many grandchildren, most of whom exemplify the saying that heredity skips a generation by being quite martial in nature. One of the latest products of the war is the ingenious device of a French engineer by the name of Schlick, to take the place of the old style crutch slung under the armpit.

The disadvantages of this aid to locomotion have always been obvious. The weight and pressure, coming as they did in the axillary region, a spot not designed by nature for them, caused in some individuals boils, in others pareses as the result of pressure on the large nerve trunks. Then, too, practically all weight was taken off the injured limb, which was prejudicial to the recovery of function.

The new invention resembles a walking stick

with a horizontal handle. Above the handle is a spring rest sloped to fit the forearm. In use part of the body weight on that side falls upon the hand and wrist, the rest is borne by the injured leg and the balance of the weight can be shifted back and forth as conditions require.

This crutch has been on trial about a year now and has been commended very highly by wounded soldiers who have tried it. It is said to be so simple and natural in its application, that proficiency in its use can be acquired in half an hour.

Preparedness should certainly include a familiarity with the merits of this new crutch; for, should war come, not the least of its problems would be the care of the crippled.

## THE EFFECT OF THE WAR ON THE YOUNGER GENERATION IN GERMANY.

In view of the many conflicting statements which have appeared relative to the effectiveness of the Allied Forces' blockade, it is interesting to hear a report which appears to be impartial, being gloomy in spite of coming from a German source. Dr. A. H. Kettner, school medical officer in Charlottenburg, takes rather a pessimistic view of the health of the school children in his district. He states that it was only half a year after the opening of the war that the adults of the working classes became underfed. At first the children did not suffer, as their parents made sacrifices for them, believing that the war would be of short duration. Then, too, the government subsidized nursing mothers, which relieved the situation somewhat.

Dr. Kettner's present report is especially interesting for the reason that in the spring of 1915, he stated that the war had made no difference in the health or development of the children. But later on he was obliged to revise this opinion when the children were weighed and measured, as is done annually. Increase both in height and weight was found to be checked, particularly among the girls. Dr. Kettner also reports an increase in two diseases of childhood, rickets and tetany. The former was, of course, easily accounted for by the poorer food supply since the war; the latter is supposed to be due in a large measure to the effect of the blockade of war upon the production of vitamin D.



The above report, emanating as it does from a German official, contrasting no doubt with what he would prefer to report and directly opposite to his previously expressed opinion, must be given considerable weight. It would seem to show that, while the Central Powers are able to feed themselves indefinitely, the nutritional quality of their subsistence must be somewhat impaired as a result of the state of war existing, and this deficiency will be felt more keenly where there is the least resistance, that is, among the younger generation.

### MEDICAL ASPECTS OF SHAKESPEARE'S GENIUS.

THE recent observance of the tercentenary of Shakespeare's death has recalled to the public mind, not only the poet himself and his works, too often neglected, or even forgotten, but also many of the books and comments that have been made or written about him. Among the many aspects of Shakespeare's genius which have been thus reviewed and considered, naturally the most pertinent to our profession is that which deals with his medical knowledge and references. Much on this subject has been written in time past; and without attempting a complete review of this literature, we may refer briefly to a few of the former and recent articles which have appeared on this topic.

In 1906 Dr. John W. Wainwright of New York published an admirable monograph consisting of a compilation of quotations from Shakespeare's plays illustrating the author's medical and surgical knowledge. This work of avocation by a busy physician constitutes a valuable contribution, which only one with a professional training could make, to the elucidation of many Shakespearean quotations and to our knowledge of the poet himself and of his mental and scientific background.

In the issue of the JOURNAL of January 17, 1907 (Vol. clvi, p. 65), is a further contribution by a physician, Dr. Albert C. Getchell of Worcester, Mass., on "The Medical Knowledge of Shakespeare," which presents, in a similar fashion to that of Dr. Wainwright, a series of grouped quotations illustrating Shakespeare's knowledge of medicine and surgery. We cannot do better than to refer readers to these two publications for complete perusal. In the issue of the JOURNAL for April 18, 1912 (Vol. clxvi, p. 603), we also commented editorially on Shake-

speare as a medical observer, calling attention particularly to the astounding accuracy of his scientific as well as his artistic perceptions.

In an issue of the *Westminster Review* some years ago, and not now available for verification of the reference, was an article by Dr. John Knott on "The Medical Knowledge of Shakespeare" in which he cites the following quotations as evidence that Shakespeare's knowledge of the circulation of the blood was really in advance of Harvey's demonstration.

"The second property of your excellent sherris is the warming of the blood, which, before cold and settled, left the liver white and pale, which is the badge of pusillanimity and cowardice; but the sherris warms it and makes it course from the inwards to the parts extreme. It illumineth the face, which, as a beacon, gives warning to all the rest of this little kingdom, man, to arm, and then the vital commoners, and inland petty spirits, muster me all to their captain, the heart; who, great and puffed up with his retinue, doth any deed of courage; and this valne comes of sherris. . . "

In the play of *Coriolanus*, the stomach, replying to the attacks of its enemies, proceeds to say:

"True is it, my incorporate friends," quoth he, "That I received the general food at first, Which you do live upon; and fit it is, Because I am the store-house and the shop Of the whole body; but, if you do remember I sent it through the veins of your blood, Even to the court, the heart; to the seat o' the brain;

And through the cranks and offices of man, The strongest nerves and small inferior veins From me receive that natural competency Whereby they live."

Another medical aspect is that of Shakespeare's doctors, which was excellently discussed some years ago in a paper by Dr. P. S. Donnellan of Philadelphia, to which the reference cannot now be found. Dr. Donnellan pointed out that,

"Shakespeare's references to the medical profession are characterized by almost unvarying respect; indeed, it would be difficult to find in the works of any non-medical author a higher ideal of the physician and his calling than he gives us. Only in two well-known instances does he hold the physician up to ridicule. Once, in 'The Merry Wives of Windsor,' in the character of Dr. Caius, whom Dame Quickly declares is a combination of the fool and the physician, and who is supposed to be a burlesque on Sir Theodore Mayerne, a French doctor who was expelled from the College of Physicians in Paris in 1603 because of his 'rashness,



impudence and ignorance of true physick.' The second instance is that of Dr. Butts in 'Henry VIII,' but he is shown as a courtier rather than a physician.

"The physicians who were the creations of Shakespeare's brain were portrayed as men of high character and skilled in the practice of their time. In 'Lear' the doctor is an expert alienist and neurologist, and manages the case of the demented monarch with such tenderness and skill as to earn the gratitude of the devoted Cordelia. In 'Macbeth,' the physician who is called upon to attend Lady Macbeth in her mental collapse following the murder of 'the unguarded Duncan,' proves himself at once a shrewd Scotsman and a tactful practitioner. Before he undertakes 'to minister to a mind diseased' or 'pluck from the brain a rooted sorrow,' he cautiously finds out from her gentlewoman-in-waiting the exact condition of his royal patient, and honestly admits 'she more needs the divine than the physician' to soothe her distressed conscience; that her disease is beyond his practice, and after giving her attendants some good advice to watch her carefully and 'remove from her the means of all annoyance,' he prudently withdraws."

In England the occasion of Shakespeare's tercentenary was chosen by Dr. Sir St. Clair Thomson to deliver the 141st annual oration of the Medical Society of London, May 1, 1916, on "Shakespeare and Medicine." This oration was quoted and reviewed at some length in *The Medical Press and Circular*.

"In Shakespeare's time, medical science was but emerging from the chaos of unlicensed and irregular practice, and the marriage of his eldest daughter, Susanna, to Dr. John Hall, of Stratford, afforded his keen observation the requisite opportunity to note the habits and ways of thought of medical men. Quacks, male and female, flourished then as now, and such practice was indeed encouraged by the fact that the regular physician was apt to cease attendance on a case he considered incurable, to save his reputation. Physic failed to minister to a mind diseased, to pluck from the memory a rooted sorrow, and to raze out the written tablets of the brain (Macbeth), and an allusion to auto-suggestion may be read into the recommendation of the patient to 'minister to himself.'"

"The works of Shakespeare contain references to ague, rheumatism, plagues, pestilence, fever, measles, 'the sweat,' leprosy, apoplexy, bone-ache, colic, consumption, convulsions, cramps, dropsy, ecstacy, epilepsy, gout, green sickness (chlorosis), heartburn, hemiplegia, hydrophobia, itch, jaundice, palsy, sciatica, senile senility, somnambulism, and visual spectra."

"The poet shared the common belief that vital spirits dwell in the arteries, and that wound trouble is attributable to the access of

air, an interesting observation regarding sepsis which recalls Lister's carbolic spray. His references to the circulation of the blood in 'Hamlet' and 'Measure for Measure' notably are prophetic, seeing that Harvey did not reach his famous conclusion until a week before Shakespeare's death. The social disease, on which a Royal Commission has recently reported, was known in Shakespeare's day variously as 'the French disease,' and 'the Neapolitan disease.' Great as was his belief in the benefits of fresh air, he still regarded night air as harmful:

"And will he steal out of his wholesome bed  
To dare the vile contagion of the night,"

"The passage in 'Macbeth':

"... Macduff was from his mother's womb  
Untimely ripp'd."

seems to indicate the practice at that time of Caesarean section.

"Shakespeare was deeply interested in mental pathology." He shows surprising knowledge of the mental confusion preceding an epileptic attack, and of the ensuing maniacal excitement. He alludes to the value of music in sickness, but hints the influence is not always beneficial, for he states that emesis may result from the sound of the bagpipes. We believe this is not unknown in enemy ranks when Scottish regiments get to work. And the untutored Southron says there is no music in the bagpipes! The genius of our greatest Englishman is clearly revealed in his insight into mental and nervous disorders, as witness the neurasthenia of Hamlet, the melancholy of Jacques, the excoimby of Malvolio, the hallucinations of Macbeth, the insane ambition of Lady Macbeth, the insanity of Ophelia, the maniacal misanthropy of Timon of Athens, the blind fury of Othello, the frenzy of Constance, the mania of King Lear, and the foolish imbecility of Simple, Shallow, and Speed. In 'As You Like It' we get a good idea of the way in which bad cases of madness were treated (the mild cases were not segregated).

"Love is merely a madness, and I tell you, deserves as well a dark house and a whip as madmen do."

"In 'Much Ado about Nothing' we find a foreshadowing of the principles which underlie the modern and kindly treatment of the mentally afflicted."

The issue of the *British Medical Journal* for May 6 contains a further report of Dr. Thomson's address, particularly with reference to the character of Shakespeare's physicians.

"Out of thirty-six plays, medical characters were represented six times: 1. Dr. Caius in 'Merry Wives of Windsor'; 2. Dr. Fluellen, doctor; and 3. A Scottish doctor in 'Henry VIII.'"

4. Dr. Butts in 'Henry VIII.' 5. Dr. Pinch in 'Cymbeline'; and 6. Dr. Ross in 'King Lear.' No other characters were named as physicians. Dr. Caius was the only one who was a



than as a regular physician, and it was probable that Shakespeare meant to represent a quack and not the learned Dr. Caius. Dr. Cornelius was possibly suggested by the famous physician of Charles V and simply adapted for dramatic purposes. The Dr. Butts represented in the fifth act of 'Henry VIII' was no doubt Dr. William Butts, Fellow of Gonville Hall, Cambridge, and of the College of Physicians, who lies buried in Fulham Church. Cornelius played with honour and astuteness a difficult part when the Queen asked him for poison, and the physician of King Lear played his part well and sympathetically. Cerimon in 'Pericles' was both a physician and a nobleman, so that the good social status of the medical man was here accepted and illustrated. No nobler panegyric of our profession could be written than that put in the mouth of Cerimon.

"Quacks, who flourished abundantly in the period, were portrayed in several plays. Among such characters were Pinch, Friar Lawrence, and Helena. Quacks and medical mountebanks were found in the earlier plays, and the first practitioner of medicine for whom Shakespeare did not entertain contempt was the physician in 'King Lear,' which was written about 1606, the year before the poet's daughter married Dr. Hall."

Finally, in the issue of the *Scientific Monthly* for June, 1916, has been published an article by Dr. James Frederick Rogers, of New Haven, Conn., on "Shakespeare as a Health Teacher." It is still another aspect from which this many-sided genius may be considered, to regard him as an early proponent of personal and communal hygiene. Though not in any sense, however, a student of sanitation, it is obvious that for his generation he had a keen insight into the nature of physical and mental health, and the causes and habits that may improve, maintain or injure it. Dr. Rogers illustrates these propositions also by quotations from the plays, and concludes that Shakespeare was, in the most important sense, a teacher of hygiene, standing among the foremost in the goodly company of non-professional writers, such as Plato, Cervantes, Molière, Montaigne, Bacon, Locke, Addison, Franklin, Carlyle, Spencer and others, "who, by both precept and practice, have been our greatest preachers of the gospel of health."

#### MEDICAL NOTES.

PROGRESS OF POLIOMYELITIS.—In the issue of the *JOURNAL* for August 17, we discussed editorially the use of immune serum from recently recovered cases in the treatment of acute polio-

myelitis. Report from New York on August 15, states that Dr. Abram Ziegler, of the Willard Parker Memorial Hospital in that city, advocates the similar use of normal serum from parents.

Report from Toronto, Canada, on August 15, states that poliomyelitis is increasing in prevalence in the province of Ontario. During June, 1916, there were two cases and no deaths; in July, eleven cases and two deaths; and during the first fortnight of August, eight new cases of the disease were reported. Of all Canadian provinces, Ontario is in most immediate communication with New York and Chicago.

Report from London on August 15 states that poliomyelitis is at present also epidemic in Aberdeen, Scotland, where 39 cases have occurred since July 1.

OCCUPATIONAL DISEASES.—At the meeting of the American Chemical Society in New York on September 25 to 30, there will be conducted a symposium on Occupational Diseases, presided over by Professor Charles Baskerville, head of the department of chemistry of the College of the City of New York.

The symposium will consider the chemical trades, prophylaxis in chemical industry, diseases incidental to work in aniline and other coal tar products, cedar lumber, mines, explosives, and a general discussion by the leading authorities of the country. These will include Drs. W. Gilman Thompson, F. L. Hofman, J. W. Schereschewsky, G. P. Adamson, H. N. Benson, W. A. Lynott, Alice Hamilton and Mr. J. B. Andrews.

THE CARTWRIGHT LECTURES.—The Cartwright Lectures for 1916 of the Association of the Alumni of the College of Physicians and Surgeons, Columbia University, will be given by Dr. Richard M. Pearce, professor of research medicine, University of Pennsylvania, on October 24 and 25. Professor Pearce's subject will be, "The Spleen in Its Relation to Blood Destruction and Regeneration."

DR. WELCH SAILS FOR ENGLAND.—Dr. William H. Welch sailed from New York on August 6 for England, to make studies in connection with the organization of the school of hygiene and public health established by the Rockefeller Foundation at the Johns Hopkins University. Dr. Welch will also study, as president of the National Academy of Sciences, the manner in which England has been organized in scientific lines for the war. He is accompanied by Dr. George Ellery Hale, chairman of the committee of the academy on scientific organization.

#### EUROPEAN WAR NOTES.

GERMANY AND RED CROSS SUPPLIES.—In last week's issue of the *JOURNAL*, we noted at length the refusal of the British Government to permit the passage of Red Cross supplies from America to the Central Empires. On August 9, the German Government issued the following memo-



random, outlining its future policy towards such supplies destined for the Allied Powers, in view of this refusal:

"Great Britain, although she had originally assented to safe passage of such articles, having declined to accept the proposals of the American and Spanish governments, having even refused to allow the American Red Cross organization to dispatch them, to the German Red Cross Society, and having further declined to listen to a protest from former President Taft on the subject, Germany is no longer in a position to grant free passage of surgical and medical requisites coming within the power of her naval forces, as she has done up to now. The German navy will receive orders to exercise in the future the right pertaining to it to requisition the medical and surgical requisites mentioned in the Spanish government's list for the use of German military forces."

#### MEXICAN NOTES.

THE AMERICAN RED CROSS has been informed by the War Department that the Quartermaster's Department will make a gratuitous issue of colored glasses, or goggles, to the troops on the Border for the protection of their eyes from glare and sand. In view of this, Major-General Arthur Murray, Acting Chairman of the Central Committee, American Red Cross, announces that it will not be necessary for these to be contributed by Chapters or other Red Cross agencies.

#### BOSTON AND NEW ENGLAND

**HARVARD SURGICAL UNIT.**—Another reinforcement for the Harvard Surgical Unit at the front in France sailed from New York on August 17, aboard the steamer *Lupland*. The new detachment consisted of 11 surgeons and 11 nurses. Dr. Daniel Fiske Jones is the surgeon in charge.

**BEQUEST.**—By the will of Mrs. Josephine Angier Binney, of Providence, R. I., the Sharon Sanatorium has recently received a bequest of \$3,000.

**THE WEEK'S DEATH RATE IN BOSTON.**—During the week ending August 19, 1916, there were 222 deaths reported, with a rate of 15.22 per 1,000 population, as compared with 206 and a rate of 15.75 for the corresponding week of last year. There were 53 deaths under one year as compared with 51 last year, and 48 deaths over 60 years of age against 68 last year.

During the week the number of cases of principal reportable diseases were: Diphtheria 38; Scarlet fever 8; Measles 23; Whooping cough 18; Typhoid fever 2; Tuberculosis 57.

Included in the above were the following cases of non-residents: Diphtheria 4; Scarlet fever 4; Tuberculosis 5.

Total deaths from these diseases were: Measles 5; Whooping cough 2; Tuberculosis 23; Anterior Poliomyelitis 4; Typhoid fever 1.

Included in the above were the following deaths of non-residents: Anterior Poliomyelitis 1; Measles 1; Tuberculosis 4.

#### Miscellany.

CHANGES IN THE MEDICAL CORPS, U. S. NAVY, FOR THE THREE WEEKS ENDING AUGUST 12, 1916.

July 24.

P. A. Surgeon C. E. Strite, detached Aeronautic Station, Pensacola, Florida, to Louisiana.

P. A. Surgeon A. J. Toulon, to Aeronautic Station, Pensacola, Fla.

July 26.

Surgeon R. W. Plummer, detached *Hancock* to home, wait orders.

Asst. Surgeon James Watt, M.R.C., commissioned from June 28, 1916.

Asst. Surgeon W. W. Hawke, M.R.C., commissioned from July 5, 1916.

July 27.

Surgeon Harry Shaw, commissioned from May 28, 1915.

Asst. Surgeon R. M. Little, M.R.C., to Navy Recruiting Station, Peoria, Illinois.

FROM COMMANDER-IN-CHIEF, ASIATIC FLEET,  
SHANGHAI, CHINA.

August 2.

P. A. Surgeon D. C. Walton, detached Naval Hospital, Canacao, P. I., to Wilmington.

Asst. Surgeon L. H. Buddis, detached *Elcano* to Naval Hospital, Canacao, P. I.

Asst. Surgeon Talmadge Wilson, detached *Wilming-*ton to *Elcano*.

August 5.

Asst. Surgeon W. J. Rogers, detached Marine Barracks, Pensacola, Florida.

August 8.

Surgeon J. C. Pryor, detached Naval Hospital, Annapolis, Md., to home and wait orders.

#### NOTICES.

NEW YORK AND NEW ENGLAND ASSOCIATION OF RAILWAY SURGEONS.—The twenty-sixth annual session of the New York and New England Association of Railway Surgeons will be held at the Hotel McAlpin, New York City, on Wednesday, Oct. 18, 1916. A very interesting and attractive program has been arranged. Dr. William S. Bainbridge will deliver the "Address in Surgery," on the cancer problem. Railway surgeons, attorneys and officials and all members of the medical profession are cordially invited to attend.

DR. D. H. LAKE,  
President,  
Kingston, Pa.

DR. GEORGE CHAFFEE,  
Corresponding Secretary,  
Little Meadows, Pa.

**ARMY MEDICAL CORPS EXAMINATIONS.** The Surgeon-General of the Army announces that preliminary examinations for appointment of First Lieutenants in the Army Medical Corps will be held on September 5, 1916, at points to be hereafter designated.

Full information concerning these examinations can be procured upon application to the Surgeon-General, U. S. Army, Washington, D. C. The essential requirements to secure an appointment are that the applicant shall be a citizen of the United States, shall be between 22 and 32 years of age, a graduate of a medical school legally authorized to confer the degree of Doctor of Medicine, shall be of good moral character and habits, and shall have had at least one year's hospital training, and shall have been continuously throughout the competition in good standing. The examination will be held before boards which can be composed of three members, one given to specialties from each of the following:



ceived, in order to lessen the travelling expenses of applicants as much as possible.

In order to perfect all necessary arrangements for the examinations, applications should be forwarded at once to the Adjutant General of the Army. There are at present over two hundred vacancies in the Medical Corps of the Army.

**EXAMINATION FOR NAVY MEDICAL CORPS.**—The next examination for appointment in the Medical Corps of the Navy will be held on or about October 23, 1916, at Washington, D. C.; Boston, Mass.; New York, N. Y.; Philadelphia, Pa.; Norfolk, Va.; Charleston, S. C.; Great Lakes (Chicago), Ill.; Mare Island, Cal.; and Puget Sound, Wash.

Applicants must be citizens of the United States and must submit satisfactory evidence of preliminary education and medical education.

The first stage of the examination is for appointment as assistant surgeon in the Medical Reserve Corps, and embraces the following subjects: (a) anatomy, (b) physiology, (c) materia medica and therapeutics, (d) general medicine, (e) general surgery, (f) obstetrics.

The successful candidate then attends the course of instruction at the Naval Medical School. During this course, he receives a salary of \$2,000 per annum, with allowances for quarters, heat and light, and at the end of the course, if he successfully passes an examination in the subjects taught in the school, he is commissioned an assistant surgeon in the Navy to fill a vacancy.

Full information with regard to the physical and professional examinations, with instructions how to submit formal application, may be obtained by addressing the Surgeon-General of the Navy, Navy Department, Washington, D.C.

W. C. BRAISTED,  
*Surgeon-General, U. S. Navy.*

#### APPOINTMENT.

DR. HERBERT R. BROWN has resigned from the position of Assistant Director of the Massachusetts State Department of Health to accept an appointment as pathologist at the Rochester Homeopathic Hospital at Rochester, N. Y., the change becoming effective Sept. 1, 1916.

#### RECENT DEATHS.

DR. ROSCOE SMITH, a graduate of Harvard Medical School in 1870, and a veteran of the Civil War, died at his home in Auburn, Me., July 8, aged 79 years.

DR. THOMAS A. KENEFFICK, of New York, who died on Aug. 1, at Lawrence, Mass., was born at that city in 1840. He received the degree of M.D. in 1885 from the New York College of Physicians and Surgeons, and since that time had practised his profession in New York City and at Newport, R. I. He was a member of the American Medical Association and the New York Academy of Medicine.

DR. FRANK HAMMET HOLT, superintendent of the Michael Reese Hospital, Chicago, died in that institution, of nephritis, August 3, 1916, aged 47 years. He was a graduate of the Massachusetts College of Pharmacy in 1895 and of the Harvard Medical School in 1899, then serving as house officer at the Boston City Hospital. There he was assistant superintendent from 1904 until April 15, 1915, when he went to Chicago. He was a Fellow of the Massachusetts Medical Society and of the American Medical Association.

DR. WENTWORTH LARRABEE HAYES, of Cambridge, died at South Yarmouth, August 13, 1916, of pneu-

monia, aged 39 years. He was a native of Gardner, Me., and a graduate of Bowdoin College and of the Tufts College Medical School, the latter in 1900. He was a medical inspector of schools and a Fellow of the Massachusetts Medical Society. He is survived by his widow and two sons.

DR. JOSEPH LOGUE LOCKARY, of Roxbury, died at St. Stephen, N. B., August 13, aged 45 years. He was a graduate of McGill University Medical Department in 1897 when he settled in Roxbury, joining the Massachusetts Medical Society in the following year, and had practised there since. He was a member of the Catholic Order of Foresters and of the Knights of Columbus. His wife died about five years ago, and he is survived by a young son and by five brothers and four sisters.

DR. EDWARD L. ESTABROOK, of Minneapolis, died at the Corey Hill Hospital, Brookline, Mass., August 20, where he was taken when attacked with a sudden illness while spending a vacation in the East.

He was born in Camden, Me., July 13, 1845, and in early life served as a midshipman and later as a second lieutenant in the Civil War. He was on the *Kearsarge* at the time of its engagement with the *Alabama*. After the war he studied medicine at the University of New York, in Vienna and in Hamburg. While abroad he married Caroline Benedict of New York. He returned and settled in Minneapolis, where he remained in active practice until his death. He was a member of the Loyal Legion, the G. A. R., the Sons of the Revolution, the Masons and the Odd Fellows. He is survived by one son, Joseph Estabrook of Minneapolis.

DR. ISADOR LETT, a prominent dental surgeon, died at his home, 340 Harvard Street, Brookline, Mass., Aug. 20, after an illness of six months. Dr. Lett, the son of Michael and Hannah (Hyneman) Lett, was born in New York City 41 years ago. When a child, he moved to Philadelphia with his parents and was educated in the schools of that city. He became interested in dentistry and entered the Philadelphia Dental College, graduating from that institution. He established offices in Philadelphia and held a large practice. He came to Boston about 18 years ago and had since practised in that city.

He was considered an authority on dental surgery and was an active member of numerous dental societies and an officer of Mt. Sinai Hospital. He is survived by his widow, three children, his mother and one brother.

DR. WILLIAM H. BAKER, who died on Aug. 22, at Lynn, Mass., was born in West Chester, Pa., on June 7, 1844. He served in both the army and the navy during the Civil War, and for a decade after its close. He settled in the practice of his profession at Lynn in 1875. He was for many years president of the Board of United States Examining Surgeons, and was Surgeon-General of the Massachusetts Department, G. A. R.

DR. THOMAS POWELL, who died recently at Los Angeles, Calif., was born in Tennessee, in 1837. He received the degree of M.D. from New York Medical College in 1858, and had practised his profession in Kentucky, Indiana, and California.

DR. BENJAMIN FAGNANT, a well-known French physician of Springfield, died at his home, Aug. 19, 1916, after a three-months' illness. He was born in Canada, in 1871, and was educated at Laval College, Montreal, but had been a resident of Springfield for the past 45 years, where he had been in practice practically all that period. He is survived by his widow and a son.



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### Address.

#### SOME THEORETICAL CONSIDERATIONS ON THE PRESENT STATUS OF ROENTGEN THERAPY.\*

By JOSEPH SHOHAN, M.D., BOSTON,

*Roentgenologist, Psychopathic Hospital and Rufus S. Frost General Hospital.*

WHEN we stop to consider the various contradictory effects of roentgen rays on living tissues, we realize at once the many difficulties—almost insurmountable difficulties—that we were bound to encounter when we attempted to make use of the rays in combating disease. Indeed, we are not at all surprised that so little progress has been made in roentgen therapy; rather that so much has been accomplished under such difficulties.

In the roentgen ray we certainly have an exceedingly paradoxical energy. It is claimed for it that it will cure cancer, and yet before anyone ever suspected that such beneficial properties resided in that ray, we learned that roentgen rays generated cancerous growth.

On the one hand, the roentgen rays excite epithelial growth, while on the other, they destroy embryonic tissue. On the one hand, they increase metabolism and raise the resistance of the organism, while on the other, they attack the leucocytes and hinder growth.

Whoever has had the misfortune to have a roentgen burn will testify to the fact that the pain caused by it is most excruciating. In fact,

few pathologic conditions are known to cause such intense suffering. Yet roentgen rays, judiciously applied, are perhaps one of our best anodynes. Many a sufferer from some form of neuralgia, pruritus, arthritis, arthritis deformans, or similar painful condition, has been spared many a sleepless night by the use of roentgen rays.

No doubt, as a result of the contradictory effects of the roentgen rays, contradictory estimates and views of them have gained a foothold among the general public, as well as in the medical world.

There are those who behold in these rays the long-sought-for panacea of all the ills human flesh is heir to, and those who regard the rays as a new, insidious foe of mankind.

Which of these two diametrically opposed views is the correct one? They are both right and both wrong.

The epoch-making discovery of that renowned Wuerzburg professor has certainly claimed its full quota of victims, not as many among the general public as among the members of the medical profession, the undaunted followers of Roentgen. But for every victim it has claimed, it has brought relief from pain and cure from disease to hundreds and thousands the world over.

In the development of the application of the roentgen rays in medicine, accident played a not inconsiderable rôle. The old adage that "necessity is the mother of invention" does not tell the whole story. It seems to me that if necessity is the mother then accident must surely be the father. At any rate, in the case of roentgen rays, accident played the more prominent rôle.

\* Read before the South Boston Medical Society, February 7, 1916.



spicuous rôle. For it was by sheer accident that Roentgen discovered these mysterious rays, and again, it was by sheer accident that the attention of the medical world was called to the possibility of combating human suffering with them.

One day when Roentgen found—to his great surprise—that the rays from his tube penetrated opaque bodies, the significance of the use of these rays to the surgeon in cases of fracture became immediately apparent. As was to be expected, such was the first practical use of the rays.

Of course, the generating apparatus, as well as the tube, was necessarily crude and primitive, and as a result long exposures were necessary to radiograph any desired part. These long exposures of soft rays (rays coming from a tube that was not very highly evacuated) were not long in producing results,—results that were not sought for and often not desired, but results that, nevertheless, laid the foundation for modern roentgen therapy.

It was Leopold Freund of Vienna who, in 1896, a short twelve months after Roentgen's epoch-making discovery, happened to read in a local daily that someone who was working with roentgen rays a good deal suffered from dermatitis and falling out of the hair. Shortly after he also read an article by W. Mareuse, in which was related a similar experience. Freund was then moved to try this new agent to remove a hairy naevus. The success of this experiment gave roentgen therapy its first impulse.

A year later, we find Kuemmel, at the Congress of German Surgeons, reporting a case of lupus vulgaris successfully treated by means of these wonderful rays. Schiff, Hahn, Ehrman, Kienboeck, Holzknecht, and a host of others followed with the favorable reports of their experiences in the application of the roentgen rays in a number of skin lesions. Sjoergsen in cases of epithelioma.

A new era was opening for suffering humanity, for a new weapon was placed in the hands of the disciples of Esculapius.

With the wonted enthusiasm of the new convert, medical men the world over took up the study and practice of this new "ology," roentgenology. Some of these early enthusiasts have long since paid the penalty of their devotion and are sleeping peacefully their eternal sleep—all but forgotten. Others more fortunate are still with us, unlaurelled and undecorated heroes in the army of peace for the cause of suffering humanity.

We in Boston should take just pride in the fact that our city has produced one of these early pioneers in the person of Dr. Francis Williams. His contributions to the study of roentgenology form veritable landmarks and are, I hope, fully appreciated.

While the reports of wonderful cures and burning disappointments—burning in more than one sense—came thick and fast, the paramount

question that agitated most of these workers was—how do these rays produce all these wonderful results? What was the *modus operandi*?

Fortunately, the medical man, with his traditional instinct for empiricism, did not stop too long in search of theories. He knew too well that the explanations of today are, alas, too often the fallacies of tomorrow. Nevertheless, in this age of rationalism, it was, of course, necessary to have a rational explanation for a basis of "rational therapy," as it is too often misleadingly termed. The rational explanations came in great profusion, needless to add, only to cause a good deal of confusion.

It was the electricity in the current with some; with others the ionization, the magnetic effect, the psychic effect. And the discussion waxed hot.

But before the roentgen therapist could find and give a satisfactory answer, the roentgen-physicist had to tell him first, what were those rays—what were their physical properties?

When Professor Roentgen in 1895 discovered that new type of radiation he himself suggested for it the term x-ray, doubtless not only for want of a more comprehensive term, but also because that new phenomenon presented to him an unknown quantity in more than one sense of the word.

Were these radiations solid particles, or were they waves? If waves, what kind—transverse like sound waves, or longitudinal like light waves? These points and a host of others kept the physicists in agitation for quite some time.

Today, the most important points are settled beyond dispute. We know that the roentgen rays are longitudinal electro-magnetic waves that can be deflected and refracted, and resemble the waves of gamma rays of radium, of ultra-violet rays, heat waves, the waves that transmit our wireless messages, and other light waves, and differ from them in one respect only, namely, the length of the wave. The length of the wave is the determining factor of its physical characteristics.

As R. Pohl aptly puts it, "The roentgen rays that emanate from our discharge tube or the roentgen rays that are emitted by radio-active substances known as gamma rays, are principally nothing else but light, and all that we know about light applies to these rays, with very few exceptions."

But while the physicists were pursuing relentlessly their war on nature in their efforts to wrest from her the secrets of the wonderful rays, the therapist was not sitting idly by.

As mentioned before, skin lesions and epithelioma were the first to arrest the attention of medical men the world over, and skin therapy was all but revolutionized.

However, roentgen therapy, unlike maligned beauty, was not to be merely skin deep.

About the year 1903 Nicolas Senn conceived the idea of subjecting a leukemia patient to



roentgen rays. He radiated the spleen of his patient, and to his great delight noticed a retrogression of the enlarged spleen and a general improvement in the condition of his patient. The report of his experiences in the *New York Medical Journal* of April, 1903, was at once taken up abroad with great enthusiasm and gave impetus to the classic researches on blood by Heineke, Linser and Helber, Jagie, and a host of others.

The year 1903 was destined to be a red-letter year in the annals of roentgen therapy. It was in 1903 that Albers Schoenberg of Hamburg, that martyr to the advancement of roentgenology, made his epoch-making observation of the phenomenon of sterility induced by roentgen rays. He made his first observations experimentally on rabbits and guinea-pigs. A year later Philipp reported the first two cases of sterility in human subjects.

This classic work of that master-mind, Albers Schoenberg, laid the foundation for our modern deep roentgen therapy, with all that it implies, and gave a new impetus to the roentgen therapist and renewed interest in the most absorbing questions,—how these rays influence living tissues and by what *modus operandi* we effect our cures and our injuries. For, as roentgen therapy assumed greater and yet greater proportions, the number of victims multiplied.

That it was not a mere chemical or physico-chemical reaction between the rays and living tissues soon became evident.

I have already referred to Heineke's researches on the blood. He and the others showed that roentgen rays effect, at first, a short temporary rise in the white blood count followed by a drop, in which the polynuclear leucocytes suffer the most, and next to them the lymphocytes. Now, if that were a mere chemical reaction, the rays ought to affect the chemical composition of the blood *in vitro*—in the test tube. But Bergonie and Tribondeau as far back as 1908 submitted defibrinated blood to the action of the rays for as long as thirty minutes and failed to detect any change whatever. They also submitted spermatozoa to similar tests, with equally negative results. Bordier and others performed similar experiments with like results. Furthermore, it soon became apparent that different tissues, normal and pathological, under the same given conditions, react differently. We saw that the various constituents of the blood were not all affected alike: the polynuclears suffering the most, while the erythrocytes were hardly affected, even after prolonged exposures. The cells of the lymphoid tissue, of the hair papillae, and of the epithelioma readily succumb to the action of the rays, while the epithelia of the skin remain intact.

These phenomena were explained by some on the assumption of a selective action of the rays on the cells, i.e. the rays attack certain cells more vigorously than others. Others again saw in the cells themselves a variable vulnerability.

Be that as it may, it is clear now that the reaction between the cells and the rays is a bio-chemic reaction. As Dean Butcher states it, "It is not the chemical reactions of material remedies, with which we are more or less familiar, but the impact of ethereal waves on living tissues. These ethereal waves of various lengths and frequencies are the real therapeutic agents."<sup>2</sup>

But if the length of the wave, or, in other words, the hardness of the ray is of prime importance, it probably is not all-important.

Wickham, whose work on the biochemistry of radio-activity is most painstaking, states:

"Every ray that strikes a cell, no matter what the source of the ray is, exerts some influence on the cell. This reaction is the result of many and various factors. The most important ones are:

"1. The degree of the receptivity of the cell; in other words, its specific radio-sensibility.

"2. The quantity of rays absorbed in a unit of time.

"3. The specific peculiarity of the kind of rays.

"4. The time elapsed between the radiation and the histologic examination.

"5. The filtration of the rays through the tissues."<sup>3</sup>

He says further that among all these factors the radio-sensibility of the cell is of the greatest interest. He continues, "When a cell is affected by the rays it is not correct to say that the ray has a specific action on the cell. It is not a question of specificity, rather of cell sensibility, of particular receptivity. This particular receptivity is what causes a penetrating ray to go through a layer of healthy tissue without affecting it, but when it finally reaches a pathological tissue underneath, it exerts an influence there."

We see from the foregoing that Wickham ascribes to the sensibility of the cell first importance, though, of course, he also takes into consideration the hardness of the ray, that is, the wave-length.

Several attempts have been made to classify the various living tissues in accordance with their radio-active sensitiveness. The following classification of Wetterer is, no doubt, the best:

"*Normal Tissues.*—Lymphoid tissue, testicles and ovaries, facial skin on child, child's cartilage, mucous membrane, hair papillae, child's body-skin, intima of blood vessels, skin on face of adult, sweat and sebaceous glands, skin on body and head of adult, liver and kidney parenchyma, blood vessels, connective tissues, muscles, cartilage of adult, bone.

"*Pathologic Tissues.*—Leukemic and pseudo-leukemic tissue, recent patches of psoriasis, acute eczema, chronic eczema, mycosis fungoides, lymphosarcoma, acute vulgaris, old patches of psoriasis, round cell sarcoma, hypertrophic pro-



tate, hypertrophic lupus, tuberculous lymphoma, carcinoma, mycotic hair, bone tuberculosis, parenchymatous goitre, lupus planus, dry form, warts, lupus verrucosus, fibroma, myoma."<sup>4</sup>

It was left, however, to Bergonie and Tribondeau to formulate a law of the radio-sensibility of living tissue, which might be said both to generalize and express synthetically all our data on the subject of roentgen therapy. Their law reads: "The radio-sensibility of the living cell is directly proportional to:

- "1. Its reproductive power,
- "2. The duration of its karyokinetic process, and
- "3. Inversely as its morphology and specific function are definite and stable."<sup>5</sup>

The third law really is merely a corollary to the first two.

To these three laws or generalizations Beclere added a fourth one. He states that "every living cell, be it healthy or diseased, when subjected to a sufficient amount of roentgen rays, will undergo chemical reactions, the ultimate result of which is the degeneration and death of the irradiated cell."<sup>6</sup>

We see thus, that in the reaction of the rays on the living cell the quality and quantity of the rays, as well as the kind and condition of the cell, are important factors. We can thus conceive of the rays as a stimulus acting on the living cell, affecting it in proportion to its vitality and stability. The young immature cell or the one still in the process of reproduction, when bombarded by the radiations, readily succumbs; while the mature and more stable cell resists onslaught, remains uninjured, and is, furthermore, stimulated to full and stable growth. This conception clarifies many of the seemingly paradoxical actions of roentgen rays on living tissues. It becomes clear to us why the skin is more sensitive than connective tissue and muscle fiber, why the rapidly multiplying lymphoid tissue is more sensitive than the skin. The phenomenon of sterility induced by roentgen rays becomes very evident. The polynuclears in the blood stream, as might be expected, are the worst sufferers when blood is radiated. This conception should also prompt us to apply roentgen therapy in conditions hitherto untried.

When I was at the St. Georg Hospital in Hamburg last winter, I had occasion to observe a large number of wounded soldiers with suppurating wounds, which, for some reason or other, refused to close up. They usually had an abundance of granulations, and a profuse creamy discharge. I suggested roentgenizing some of these wounds. Needless to add, I did not aim at a bactericidal effect, for the dose required to attain that is much too high for therapeutic purposes. What I hoped for was, on the one hand, to strike at the polynuclear leu-

coeytes, which furnish almost all the pus cells; also at the granulation tissue, which consists of rapidly proliferating vascular endothelia and fibroblasts; and, on the other hand, to stimulate many of the more resisting fibroblasts to mature growth, and thus hasten cicatrization. My results exceeded my most sanguine expectations. A preliminary report of this work was made before the Hamburg Medical Society.

The next question that rational roentgen therapy had to answer was whether the action of the rays was purely local or systemic. In other words, is the effect of radiation merely the result of the reaction between the rays and the cells they happen to hit, or do the rays in some way exert an indirect distant influence over the entire organism? This question has more than academic interest, for were the effect a purely local one, we could never hope to accomplish anything with this new agent in our combat with malignant growths. No local agent, however promising, could ever prove successful against them, not alone because we are not at all certain that these growths are purely local phenomena, but also because in any given case of a malignant growth we have no means of ascertaining that some metastatic foci do not already exist at some distance from the given focus. No doubt, the much too common post-operative recurrences are in most cases due to remote metastatic foci. Wetterer, in discussing Ritter's negative experimental results, adds, "However, one is not justified in excluding the possibility of an indirect effect of radiation."<sup>7</sup>

F. Gudzent, in his lucid discussion of the influence of radio-active substances on the blood, says: "But the question whether this effect is a direct or indirect one is not yet settled today. However, the experimental observations that point to the contrary do not harmonize well with the common observations made by therapeutists. It is an established fact that leukemic tumors recede, even when they are not directly exposed to the action of the rays. Furthermore, as Arneht pointed out, the entire condition of the blood is greatly improved by the radiations; it undergoes a biologic alteration of function which could never be explained by the mere destruction of cells."<sup>8</sup>

Robert Knox, in his very admirable text-book, in the chapter on "Action of Radiations Upon Tissues," says: "The action of radium and x-rays upon the normal tissues and on morbid growths is . . . not purely a caustic action. In addition to the direct evidence of a local action of radiations upon the cell of a new growth and its surrounding tissues, there is reason to believe that a general effect is produced upon the whole body."<sup>9</sup> He points out the general improvement in the patient's health while under treatment, no matter what area of the body is radiated. He concludes: "The general effect may be quite as useful as the local, and if it has any value at all, it would be extremely useful to bear it in mind, because one need not then



limit the areas of exposure. After local treatment has been pushed to its limit, the treatment may be continued in other parts of the body."<sup>9</sup>—a very valuable and far-reaching suggestion.

While the experimental evidence is as yet not conclusive, the empirical evidence is overwhelming that the effect is systemic as well as local.

Of late years the post-operative radiation of all malignant cases has become almost universal in Western European clinics. The observation was soon made by many roentgen therapists that when they radiated the scar of an amputated breast, in many instances, the enlarged glands in the axilla disappeared of themselves, although never exposed to the rays. It was further observed that quite often while a patient was being treated locally for malignancy of the breast, a foul vaginal discharge from which she happened to suffer at the time was markedly improved. These and similar phenomena could be explained only on the assumption that the rays effect a systemic action.

How this is brought about is of less practical import to the therapist. I shall merely mention that three hypotheses have been advanced. The radio-vaccine hypothesis of Dean Butcher is probably the most plausible one. As opposed to this vitalistic theory, Professor Stephane Ledue proposed the mechanistic theory. Another is the so-called cannibalistic theory of Ross. I do not intend to enter here into a discussion of the merits of these different hypotheses. But I do want to call your attention to the circumstance that every time we roentgenize any given area, we thereby also radiate the entire volume of blood. Landois states that the duration of the blood circulation in a healthy human subject, with a pulse-rate of 72 per minute, is 22.5 seconds.<sup>10</sup> This being so, it follows that the entire volume of blood passes through the heart in 22.5 seconds. Were we to roentgenize the heart area with sufficiently hard rays, say a parallel spark gap of 10 inches, then the blood in the heart would receive approximately half of the skin dose. If the skin dose administered through several ports of entry were 100X, then the heart would receive about half of the skin dose, or 50X, and the entire volume of blood would receive 2.25X—quite a respectable dose, when we stop to consider that 1/13 of the whole body weight is subjected to it.

What is true of the heart must needs be true whenever we radiate any given vascular area in which the combined volume of its blood vessels is equal to the volume of blood in the heart. And this roentgenized blood makes its way freely through the entire organism, and bathes every one of its cells. Such being the case, it is difficult to conceive of the blood not exerting a greater or less indirect influence over the entire organism.

In the foregoing I have attempted to point out the theoretical difficulties which roentgen therapy met on its way, and to a certain extent

overcame. There were, however, others more immediate and more practical. The problem of dosage soon assumed formidable proportions. As soon as we found out that radiation in certain amounts proved beneficial, while in other amounts harmful, it became evident that without some means of measuring the exact amount to be given in each case, we were all at sea, and roentgen therapy was without a future. For, with too much caution, we might administer less than was necessary, and defeat our object. Nay more, we might even harm our patient with the smallness of the dose, or administer an overdose, with invariably disastrous results.

For a while the roentgen therapist certainly worked under difficulties, keeping within the safest possible bounds, and almost despairing of better days. It was then that Guido Holzknecht, the foremost of our pioneers, and himself a victim of his roentgen experiments, came to the rescue and devised his dosimeter. He was followed by Kienbeck, Sabouraud, and others with various devices. To be sure, a great deal is still to be desired in the matter of quantimetry, but Holzknecht's device was certainly a great step in the right direction.

We hear nowadays a great deal about deep-therapy. Usually we mean by that therapy in gynecology, although it really refers to the therapy of all deep-seated organs. Now deep-therapy is not conceivable without the classic researches of Perthes in the matter of filters. It was again in 1903, in that red-letter year, as I have already termed it, that Perthes called attention to the fact that it must needs be possible to increase the deep effect of radiation, when a filter of some sort, like aluminum, is interposed between the tube and the patient, thus intercepting the soft rays and permitting the hard ones to reach the patient. He added that it would be desirable to ascertain to what extent this increased effect can be induced. And he did determine it, for in the following year he published his researches, which, as Gauss and Lembke—the fathers of modern intensive therapy—say, were of fundamental significance for the development of deep-therapy.

Indeed, while it is true that in the early years roentgen therapy was confined merely to skin disorders and other superficial lesions because of the lack of proper appliances, lack of dosimeter, lack of filter, and even lack of appropriate tubes, today the conditions are altogether changed. In this connection let me state that the perfected tube of Dr. Coolidge has improved the armamentarium of the roentgen therapist a hundredfold.

Today, deep as well as superficial roentgen therapy is no longer an experiment but an established fact.

We have seen how the theoretical ground has been cleared from the physicist as well as from the biochemical aspects, the practical and technical difficulties have been overcome, and that the purely empirical fact, the efficacy of the radiation



tory therapists has grown so fast that it forms a vast literature of its own.

It is not my intention to-night to enter into a discussion of skin therapy; the roentgen ray as a therapeutic agent in dermatology has long proved its worth and is established as the remedy par excellence for many skin diseases, especially those of a more chronic nature. Slowly but surely roentgen therapy is widening its scope in internal medicine, surgery, and last but not least, gynecology.

As far back as 1902, fourteen years ago, Dr. Francis Williams treated the first case of Basedow in his roentgen laboratory. He was followed by the late Carl Beck, and a host of others. It was at that memorable meeting of the medical society of Vienna, where Holzkecht, then a comparatively young docent, made his brilliant retort to the well-known Professor v. Eiselsberg. Professor Eiselsberg, one of Austria's foremost surgeons, discredited roentgen therapy in Basedow, and went so far as to accuse it of causing adhesions and making any subsequent operation more difficult. Holzkecht demonstrated a series of cases and remarked, "You see, gentlemen, that the roentgen therapy is not at all 'immaterial,' and is not effective 'only on rare occasions,' as Professor von Eiselsberg would have you believe, rather are the good results frequent, and at times brilliant." In defense of roentgen therapy he quotes from a letter that he received from Carl Beck, in which the latter had stated, "In Basedow my results in most cases are downright wonderful; in smaller struma I had only one failure out of 38 cases, five of these were partly successful. The result in the other 32 cases—90%—was just splendid."<sup>11</sup>

Belot reported recently 30 cases of Basedow, out of which only five showed no improvement, and those were not true Basedow's. He quotes Ledaux-Lebard, who said, when speaking of roentgen therapy in Basedow, "everything goes along in the favorable cases as though under the influence of the roentgen rays, the hyperthyroidism is gradually substituted by normal secretions, or as though the very products of the glands gradually approached the normal."<sup>12</sup>

I recollect three cases that I had under treatment while I was assistant to Albers Schoenberg. One was a post-operative case in which one lobe was removed and the other roentgenized. Beck was the first to suggest this combined method. I could see constant improvement in the three cases, both subjectively and objectively, while I had them under my observation.

I have mentioned before Senn's classic case of leukemia. The medical literature of to-day is full of hundreds, possibly thousands, of cases reported, some with more, others with less favorable results. Beclere recently reported 110 cases, some of those observed since 1904. In talking of the lymphatic leukemia (12 cases) he says that all these cases have been influenced

by the radiation quite remarkably. The first sign of improvement was the return of the patient's strength; along with the diminution of the spleen and lymph nodules came the disappearance of the insomnia, the return of the appetite, and the increase in weight.

He had ninety-three cases of myeloid leukemia. Of these he says, "The consequence of our treatment was that up to date we did not have any case that was not favorably influenced by it."<sup>13</sup>

The treatment of phthises is still *sub judice*, but the experimental and clinical work of De la Camp and of L. Kueperle are highly interesting and worthy of attention.

For a while I had a patient under treatment—a far gone case—nevertheless, I noticed a marked diminution of sputum, and, what was more interesting, she gained a pound during the first week of treatment, the first pound she had gained in many months.

I spoke of the roentgen rays as an anodyne in neuralgia, sciatica, pruritus, arthritis, and the like. I recall one interesting incident that occurred while I was in Hamburg. One morning I overheard a conversation between two patients in the treatment room. One was saying to the other, "Say, why don't you ask him, he will do it?" As I approached they said no more. When I inquired of one what it was all about, she informed me that she had merely suggested to Frau So-and-So to ask me to treat her sciatica, which had continued bad for the past few days. Frau So-and-So was being treated for mediastinal sarcoma post-operative. I asked her how she knew of the treatment of sciatica by roentgen rays, and whether she believed that the rays were a cure-all. "Oh, no," was the frank answer, "but my sciatica does not trouble me any since I am being treated." Now this patient was being treated for a good-sized fibroid, and received roentgenizations posteriorly as well as anteriorly. It was new to me, and I told my chief what I had learned from my patients. He laughed and said that he knew that such cases were reported, although he had never treated any knowingly.

As a matter of fact the utilization of the roentgen rays as an anodyne dates as far back as 1897, two years after the discovery of the rays. Gocht reports a case of long-standing trigeminal neuralgia. The patient came to him for surgical aid, for his suffering was intense and could be relieved only by large doses of morphine. Instead of resorting to an operation, Gocht tried, by way of experiment, to expose his patient to the roentgen rays. Much to the surprise and delight of both doctor and patient, after the second day of treatment the patient was free from pain and could get along without morphine.<sup>14</sup>

Numerous similar results have been reported since then, both in this country and in Europe.

Engelken reports a very striking case. A man,



48 years old, suffering from right-sided neuralgia of a branch of the trifacial nerve, was operated on, and the offending nerve was removed without any relief to the sufferer. After four radiations of fifteen minutes, the patient was free from pain. There was a relapse four weeks later, which yielded to treatment in a similar manner.<sup>15</sup>

Tuberculous lymphadenitis forms a particularly grateful field for the roentgen therapist. These cases, judiciously selected, yield to treatment almost invariably. In view of the good results reported by all observers and amply sustained by my own experience in a number of cases, I feel that it is an injustice to disfigure so many faces, when by means of roentgenization they could well be left unmarred. At least, it seems to me that every victim of tuberculous glands has a right to demand from us that we give him a chance by means of roentgen therapy to escape the scarring of the surgeon's scalpel.

Roentgenotherapy in gynecology is a very broad subject, and I can not stop to discuss it in detail now. In European clinics, at least, it is too well established to need any argument in its favor. Out of the Freiburg clinic, Gauss and Lembecke reported two hundred and five cases. These were treated between 1908 and 1912, a period of four years, and comprise cases of myomata and various forms of metropathies. The former class of patients form by far the largest number. The object of the treatment in all these cases was to produce amenorrhea, and where a tumor was present, to reduce it in size. Both these objects were attained in practically all the cases. The results were particularly brilliant in the last two series of cases after they had perfected their technic, which enabled them to administer large doses. In their summary they go so far as to declare, "We are now so certain of our technic that we can cure our patients in a short time to stay cured, no matter what their age and the size of the tumor may be."<sup>16</sup>

Beclere recently reported sixty-six gynecologic cases treated by him with roentgen rays. Six of these patients were treated for bleeding only—no tumors of any kind could be made out. Two of these even had a subnormal uterus. All the other cases showed a palpable tumor, and complained of irregular uterine hemorrhages. He states that "the attained results in all those cases were very favorable." He adds, "in the treatment of the uterine myoma by roentgen rays, more importance is to be attached to the direct action of the rays on the tumor muscle itself than on its indirect action through their influence on the ovaries."<sup>17</sup>

My personal observations in the laboratory of Albers Schoenberg bear out fully the statement of Gauss and Lembecke. A large number of patients of various ages were treated there for various conditions, such as myoma, fibroma, climacteric disturbances, and metropathies of various kinds. I recall a very striking case of

a young woman of 34, who came to us almost in a state of collapse from dissanguination. She suffered from anemic headaches, cardiac palpitation, insomnia, and general debility. She responded to treatment remarkably well. I left the laboratory while she was still under treatment, but her uterine hemorrhages had almost ceased.

Such and similar observations lead me to conclude that in all cases of fibromata and myomata the very least we should do, in justice to ourselves and to our patient, is to let her choose between surgical therapy and roentgen therapy; for where there are no indications to the contrary, the latter is at least as efficient as the former, without its accompanying risk.

F. Ebler, in discussing roentgen therapy in gynecology, remarks, "The time is not far distant when no gynecologist will be considered progressive who will not use roentgen rays in his daily practice."<sup>18</sup>

Before I close, I wish to say a few words on the present status of roentgen therapy in malignant cases.

If the biochemical theories which I have briefly discussed before mean anything at all—and they surely mean a great deal if the generalizations as laid down by Bergoni and Tribondeau synthesize the facts—then there is ample reason to hope that roentgen therapy has within itself the promise of a better day for the sufferers from malignant diseases.

Kroenig of Freiburg and his followers, already a school by themselves, some of whom I know to have come to seoff and stayed to pray, have already placed their knives back in their sheaths and have replaced them with the roentgen tube. I am not quite ready to follow their lead yet, but for the glory of surgery and in justice to humanity, let at least every post-operative case be judiciously roentgenized. We shall surely have fewer recurrences then.

The pioneer work has long been done. It is for us to do the rest.

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## Original Articles.

### SOME EFFICIENCY PROBLEMS IN COUNTRY MEDICAL PRACTICE.\*

By FRANK H. WASHBURN, M.D., HOLMEN, MASS.

Not many decades ago an individual afflicted with disease often determined his own prognosis in the choice of his physician; *i.e.* results, as far as medical influence affected them, depended upon the skill and judgment of his doctor, who worked, usually single-handed, with the resources at his command, largely his personal, mental and material equipment.

Since the advent of the microscope, the arrival of the influence of biology, of animal experimentation, the entrance of the various branches of science into diagnosis, the increase of specialization, the development of instruments of precision, the organization of public health forces, and finally the development of team work, not only in surgery but in the diagnosis and the therapeutics of internal medicine, there has developed in every community what may be termed its "medical machinery" and upon the efficiency or inefficiency of this structure depends the prognosis of an individual case rather than upon any personage. To be sure, the keenness and conscience of the practitioner consulted is and probably ever will be a factor of great importance.

It would be a waste of time to enumerate all the component parts of this health promotion group, or this "machine," which exists in every municipality; however, it must be apparent that the smaller the community the less elaborate, if not less efficient, must this be.

It is of the development of the efficiency of this "medical machine" in small communities, rather than that of individual effectiveness, we wish to speak; and although we are all factors, or parts, but limited discussion of the individual as such will be entered into.

That the stigma of comparative inefficiency to some degree occasionally attaches to the country practitioner may be asserted without fear of successful contradiction. Whether the brand be just or unjust, or whether his actual shortcomings be fancied or real, does not alter this fact. In support of this statement the essayist recalls the fact that when he made his debut in his present village location, one of his greatest assets was the prevalent knowledge that he had practised in Boston. The fact that he had been a mere struggler there, and for but a brief period, mattered not. Conversely, he recalls that being a country doctor became somewhat of a handicap in his Worcester practice a few years ago.

A short time since there appeared in the *Journal of the American Medical Association* an article on the "Conduct of Normal Labor."

\* Read before the Worcester District Medical Society, April 12, 1916.

which probably would have been a timely essay had it been published a quarter of a century ago. Many protests were received by the editor, who explained its appearance by stating that it was intended for the men who practise in the country, away from the great medical centres. It was gratifying to note that a deluge of protests emanating from country doctors all over the United States were poured in upon the editor of the journal, indicating that some, at least, do not grease their hands with petrolatum before inserting them into the uterine cavity, and that rubber gloves are not unknown even in the backwoods.

Before we who practise in the suburban and rural districts refute this charge of comparative inefficiency, let us analyze, as far as we may, our conditions, and by a process of introspection examine the motives that may have lodged in our conjunctivae.

We trust it may be granted that the men who enter upon country practice as they leave the medical school and hospital are, on the average, practically as well equipped as they who begin their professional work in the great cities.

Even this is sometimes controverted. In the recent State Board number of the *Journal of the American Medical Association*, Gordon Wilson, in an article on "Medical Education with Reference to Rural Communities," endeavors to show that college-bred men graduating from high-grade medical schools avoid rural communities, and suggests two grades of medical schools, evidently intending the class of schools having low-grade requirements to furnish men for country practice. No one doubts that certain men train with definite hospital appointments and teaching positions in view, and finish their medical training equipped to the superlative degree. Such men, of course, do not even consider a country location,—however, they form but an exceedingly small percentage of even the thoroughly trained. To the rank and file, we feel that both city and country appeal, regardless of preparation.

The desire to gain an active practice quickly, the love of the open and the demands of broken health are among the most frequent incentives to the young physician's choice of a country practice. As he becomes established, he learns that his ever-increasing activities bring him in contact with an endless variety of humanity and of social phases; and as varied morbid psychic and physical conditions. He is thrown upon his own resources, often where his city brother may share his responsibilities with his neighboring colleagues.

What a school of self-reliance this should be, and is; but there is another phase. One here finds himself doing one of two things,—either endeavoring to meet, unaided, many medical problems, whether involving the eye and ear, or the genito-urinary system, the female reproductive organs, the digestive tract, or "what



not"; or he is directing his clientele to the various specialists of varied eminence, practising in their restricted fields in the most accessible large centre.

The first is inclined to spread himself out thinner and thinner as the demands upon him increase, until he is brought face to face with the problem of combating the tendency to superficial attention to his cases, and likewise superficial knowledge. The second tends to lack of confidence and self-reliance, and to final deterioration into a human guideboard.

These are but propensities, for it is apparent that only a portion become superficial thinkers, or acquire justification to have "dirigo" placed upon their tombstones.

The doctor in the less populated district has few colleagues about him, and too often he considers them as competitors. The prospect, or rather fear, that he may lose patients deters him from leaving home for post-graduate study and recreation, thus the tendency to become "stale," as we say, with the resulting sluggish cerebration and mental astigmatism and myopia.

The country doctor pays a little more for every domestic commodity—his groceries, meats, coal, electric lights, etc.—than does his city brother. His area of travel is greater, and likewise the expense in time and money in reaching his cases. His rent, if he does not own his home, may be a trifle less. That he gets less of the modern conveniences is not relevant. He charges fees that are less by 30 to 40% than those of the urban doctor. He gives away throughout each year hundreds of dollars' worth of drugs. All these are mentioned as retarding the growth of his armamentarium, and especially of his library,—his "sine qua non" as regards mental improvement.

Because of the inaccessibility of hospitals, his emergencies are often attended without the assistance of competent nursing, and his charity cases are, necessarily, usually attended without the help of trained assistance of any kind, however urgent may be the need; thus another tendency to inferior results.

He is remote from clinics, the meeting-places of his societies, libraries, and that which is fully as important,—the proximity to enthusiastic men with whom he may discuss his cases and talk shop.

Now what should concern the individual rural medical practitioner himself is the question as to whether he has done his part in maintaining and enhancing his personal efficiency, and that of the health promotion and conservation forces potential in his community.

Critical introspection long ago forced upon the writer the secret acknowledgment that the "medical machine" of his neighborhood, of which he was a part, needed much adjusting to meet its normal efficiency and output. A more or less definite plan was outlined, and it occurs

to us that, while as yet little has been achieved, the incipient efforts of my colleagues and myself to better medical results in Holden—a town of less than 2500 permanent residents—might be of interest, as illustrations in this discussion, to others similarly located, and that mutually beneficial suggestions might result.

First, and most important, the acquisition of personal knowledge must be an important part of any plan of this kind, and feeling that our position, in this respect, contains nothing to exhibit, we merely leave this as a general statement. No man should be satisfied with what he can "dig out" from his own experience and the literature at his command, however valuable, but should get into personal touch with the work of others. Whether one's interest lies in the line of surgery or internal medicine, post-graduate study, visits to the master teachers and their clinics should be aimed at. The aetna achievement is possible only through expenditure of time and money. If one exists upon the ordinary income from country practice, this is difficult. This leads us to the consideration of the commercial phase of practice, a subject we are reluctant to touch, yet, as long as we must exist under a system of profit, just as does the tradesman, we must face it. In Holden we have gradually increased our fees. That gradual increase will stop only when we are getting material return for our work equal to that of city practitioners, and can support our families somewhere near equally with our neighbors, who are tradesmen, clerks and mechanics. To those who are deferring raising their fees because neighboring physicians are not ready to come in, we can say from personal experience that only a negligible amount of practice is lost, and one's condition is but improved by independent action.

To our confrères of the towns, we wish to say that, although we have discussed what might be termed the etiological phase of lack of efficiency, we have intended to refrain from actual admission, but are trying to view what others think of us.

Now people expect what they pay for, and while we offer our services for three-fourths of the value placed upon theirs by certain others, can we but expect the public to judge us by any other than its usual standard of values? We trust that no one will misunderstand our position, especially to conclude that we stand for grasping.

While we advocate a greater income for our services, or rather, while necessity demands it in the interest of efficiency, we must ever keep in mind the ideals of our profession, and the fact that primarily our object is a humane one, and that our instructions should be given as freely to the poor as to the rich, and that we should be ready to make sacrifices. If a more efficient service should be rendered to the community, we are ready to do it.

Briefly, we state our plan for the future.



sion; our incentives, education, science and humanity. But incidentally our very existence, and professional improvement as well, demands a certain amount of "cold cash." I know of no desirable alternative to charging those who are able to pay, a fee that will compensate for our altruism to the extent of, at least, ensuring us an income by means of which we may live honestly and at the same time keep pace with current professional advances.

No plan of mutual improvement can meet with its maximum success without neighborly association among members of the local profession, and the absolute quashing of professional jealousy. We have found that, whereas formerly we considered the employment of a "locum tenens," during temporary absence from our practice, necessary, it has proven no less profitable merely to turn the work over to our colleagues, permitting the patients to make the choice. Enhancing this friendly state, and to the improvement of actual results, we have found our neighbors better qualified for certain work than ourselves; thus one takes an interest in the neuroses and in electro-therapeutics, and as all such special cases in a small town are but enough to support one good equipment, the cases needing special thought are referred to him; another acquires supremacy in skill in anesthetizing, and should have that practice. In this way we may divide the work to our mutual relief, as well as benefit to the patient. "Creeping into the lives of men everywhere," said Elbert Hubbard, "is the thought that co-operation is better than competition. We need each other."

The practitioners of three or four contiguous small towns may unite in a medical club, with splendid results. The free discussion at these less formal clubs often creates an interest among the members which tends to the exchange of much practical knowledge. The long distances necessarily traveled by the members who attend is, since the automobile has become the universal mode of travel for the doctor, less of an obstacle. We recall many profitable evenings spent with the Rutland Clinical Club.

We have no intention of discussing the pros and cons of drug dispensing, but wish to say that unquestionably it is an impossibility for one to have at hand all the remedies desirable for modern therapeutics.

A practitioner whose only source of immediate supply is his own drug stock is daily forced to make undesirable substitutions. The coming of a *reliable* pharmacy to any town where none has previously existed should, in the interest of therapeutic results, meet the approval and welcome of its doctors.

When some of the local societies began to talk of a visiting nurse for Holden its physicians approved. The visiting nurse is the solution of many of our efficiency problems in rural practice. She brings asepsis to the mill tenement

obstetric case; she ensures the pursuit of a hygienic regimen in the home-treated tuberculous case; she may follow up the suggestions of the school physician and make his work bring results, and she may be an invaluable assistant to the board of health. Our society has disseminated knowledge by lectures at its meetings upon "Rural Hygiene," "Facts About Cancer," "Oral Prophylaxis," "Common Sense in Contagious Diseases," "Tuberculosis," "Prenatal Care," etc., and hopes to enlarge its scope in the future.

A few years ago some of the public-spirited men of Holden met with its physicians, and discussed the practicability of a small public hospital. At that time it appeared evident that the money could have been raised for the building and equipment, but none of us felt that we could prophesy a proper maintenance in so small a town without an available fund of some kind. Subsequent experience has taught us that it could have been accomplished. While that scheme was suspended, the need of hospital advantages for our patients continued, resulting in the opening, something over a year ago, of the Holden Cottage Hospital, which is under private control, but attempts the functions of a public hospital. This institution is a small nursing home, modest in its outlay, consisting of a 10-room house, equipped with accommodations for five or six patients, and the necessary appliances for the care of medical, surgical, and obstetrical cases.

The operating room, while small, is supplied with good north and west light in day, and ample electric illumination by night. The sterilizing apparatus is, at present, of the non-pressure type, requiring considerable time and attention in its operation, but efficient for perfect asepsis. Essentials consistent with modest outlay have been aimed at, and elaborate appliances have not been possible.

The hospital is owned and conducted by a lady—not a trained nurse—and her husband. One trained nurse is constantly in charge; others are employed as occasion permits. The average number of nurses the first year was about two. At operations requiring an extra nurse, the visiting nurse is employed. In this way we are enabled to maintain something of a team. The privileges of the hospital are open to any physician in the community, or any other practitioner of known reliability.

The charges for board and nursing are from \$15 to \$25 per week, with an extra fee for use of the surgery, dressings, etc.

The following brief abstract of the first year's report is submitted:

Number of admissions.....	74
Male .....	35
Female .....	39
Residences:	
Holden .....	44
Worcester .....	15
Other cities and towns.....	15



The cases for treatment were:

Medical .....	17
Surgical .....	48
Medical and surgical .....	2
Obstetrical .....	7

Of the 74 cases 5 died.

Besides these, there were 5 newborn with one still-birth.

The causes of death were:

Medical—uremia .....	2
Acute colitis .....	1
Chronic asthmatic bronchitis .....	1
Surgical—acute intestinal obstruction .....	1

This death followed operation upon strangulated femoral hernia in an old lady of 75 who had suffered from an attack of uremia due to chronic Bright's disease.

Operations under general anesthesia .....	40
Operations under local anesthesia .....	4
Operations without anesthesia .....	4
Average number of patients per day .....	2 53/73
Least 0. Most 7. Average stay .....	834/37 days

While it may be outside the intended scope of this paper to describe details of the surgical work, I desire to allude briefly to two or three of the most prominent features in routine procedure. My reason for this results from a conference, at about the time of starting the project, with a member of our society who is a prominent surgeon and a valued personal friend, from whose conversation I inferred there might be doubt as to whether some of the refinements of modern technic could be accomplished under conditions which must obtain in so small an institution.

While any visitor or consultant uses methods to his liking, ordinarily we confine our aseptic technic to the simplest. Iodine preparation of dry surfaces, or thorough cleansing of moist surfaces with soap and water followed by ablutions of 70% alcohol, constitutes the whole scheme of skin preparation in the patient. Soap and water, boiled rubber gloves and 70% alcohol suffice for the operator's hands. As few drapings as necessary to cover the field properly, and as few assistants as consistent with reasonable needs, are used.

While strict asepsis is the "sine qua non," next in importance we consider the *anesthesia*.

If the patient is in hand for a sufficient period, he is put upon a low proteid, high carbohydrate diet, believing that we may in this way in some measure lessen the possibility of post-anesthetic acidosis. Other dietary changes are made for special conditions. Each patient undergoes a thorough examination prior to being given a general anesthetic. A chemical examination of the urine is made, and a microscopical examination of the sediment if there is reason for it. When any renal lesion or continued urinary obstruction is present or suspected, functional kidney tests are made. Blood pressure and cardiac abnormalities are brought to the attention of the anesthetist. If anemic, the hemoglobin is estimated. Unless contraindicated, morphine and atropine, in suitable dosage, are given subcutaneously one-half to three-

fourths hour prior to starting ether. We prefer the open-drop method of giving ether, yet concede that good etherizing may be done by other methods. While impressed by the reports of the experimental work of Yandell Henderson, we are unconvinced, by Henderson and Bryant's argument, of the greater safety of the closed and quasi-closed methods. Undoubtedly, acapnia, which they point out as the real danger, is at least a pertinent one, and the color sign a valuable warning and guide; yet, while our anesthetics amount to but few hundreds, we feel that the striking difference in the amount of post-anesthetic shock, nausea and other untoward results favor the open method.

An anesthesia slip is filled out, upon which is recorded the amount used, and all facts bearing upon the anesthesia. In bad ether risks, local novocaine anesthesia is used and just ether enough, when demanded, to meet the exigency. Every ether patient is watched to recovery by a trained nurse. This is insisted upon unless a physician is present. One physician in town does nearly all the anesthetizing. Occasionally one skilled in giving ether is called from a distance.

In brief, the safety and efficiency of operation is affected by the anesthetic, especially by the manner of administration, and we believe that the anesthetist should take his work seriously and expect and receive, in pay cases, a respectable fee.

Specimens for examination are sent to a pathologist. Such work only as urine, sputum and blood examinations, the inoculation of guinea-pigs, etc., is done in the hospital laboratory.

We have endeavored to develop something of a team, and while still very imperfect, we are pleased to say, with gradual improvement. Consultants are freely called, and when special conditions, as occasionally happens, indicate it, patients are referred to other and larger clinics.

Any patient, medical or surgical, admitted to the hospital, is considered primarily a patient of the physician in attendance prior to admission, and but temporarily under the care of whoever treats him. The benefit of his doctor's history of the case, and his advice, is sought and appreciated. On discharge we endeavor to relinquish the patient in a manner that he may carry the same high opinion of his family medical adviser which he held on his admission. We endeavor, with the assistance of the family physician and the visiting nurse, to follow up discharged patients, where any practical result may be obtained.

The Holden Cottage Hospital has not decreased our work, our assets, or our efforts. It has enabled us to study some of our cases and advantageously, we believe, to the good of all concerned. Its work has thus far been accomplished with very limited capital and it is continued existing as a factor in our efforts.



But one more factor in our structure will be mentioned. Obviously the present system of health departments, generally in vogue in towns, is no longer sufficiently effective. The duties of a board of health are invested in the board of selectmen, who delegate the executive work to someone designated by them as health officer, usually a practising physician. The scope of departments of sanitation has greatly broadened, in recent times, so that a separate board of health, at least, should be adopted. The best method of which we are aware involves, besides this, the union of a group of contiguous small towns in the employment of a trained health officer, in the manner now practised in the employment of school superintendents. The building laws for towns will undoubtedly be adopted generally as soon as the public become informed of their moral, sanitary and other benefits, and their effectiveness will be in ratio to the potency of local health departments. The initial movement toward changes of this kind must emanate from physicians.

Holden is at present, in this respect, still in the antiquated list, but we are hoping for the ultimate adoption of some such system as that above outlined.

## CIRCULATORY DISTURBANCE IN THE OBESE.

BY CLIFTON L. BUCK, M.D., DANVERS, MASS.

BEFORE entering upon the treatment of any cardiac affection it is necessary that a clear understanding of the various influences which may affect the circulatory organs in that particular case should be thoroughly understood. This is still more true if we desire to treat the patient on a rational system and not as a matter of rule of thumb, since, on careful analysis, the symptoms and circumstances which have led to the circulatory disturbance will be found to vary so widely that each case must be treated according to its especial indications.

It is the purpose of this paper to call attention to one factor in the treatment and prophylaxis of circulatory disturbances which, judging from the brief references in the text-books, and most special articles, has not received as much attention as it would seem to warrant, since it is a condition seen very frequently in general practice. I refer to circulatory disturbance in the obese; that is, circulatory disease in patients who are overweight for their height, age, and general build.

Obesity in youth and early adult life, unless complicated by cardiac disease, is, as a rule, not serious. After 35-40 years, however, men and women are very apt to take on weight more rapidly because of lessened muscular activity without a corresponding decrease in the amount and caloric value of food taken. It is at this time

that the degenerative diseases of the circulatory system often begin.

In many cases there seems to be a family tendency toward the development of obesity. This may or may not be the result of some perverted action of the so-called ductless glandular system. That this system does have some influence over metabolic processes may be inferred from the well-known changes which result from disturbance of thyroid secretion, as in exophthalmic goitre, myxedema, and in the marked bodily changes following castration. However, in practically all cases of obesity a greater or less excess of the fat-producing elements in the food exists. That this daily excess may be small and still result in the development of obesity may be appreciated when it is considered that the addition of only 10 grams of butter to the daily diet would result in the addition of approximately 90 calories to the fuel value of the diet. This excess continued for one month would result in the addition of approximately 2700 excess calories; food sufficient to supply an average-sized man for one day, at light work.

That an excess of fat may cause circulatory disturbance, or seriously affect the action of a heart crippled by some acute disease, as rheumatism, scarlet fever, or repeated attacks of tonsillitis, is readily seen when it is considered that the main purpose of fat in the body is to serve as a source of reserve energy. When an excess of food is taken, that is, when the caloric value of the diet is greater than is needed to meet the body requirements, the excess not needed is deposited as fat.

The fat deposits are particularly well marked around the heart, in the omentum, abdominal wall, and in the arms and legs. The fat around the heart interferes with the action of that organ by restriction of space in the pericardial sac, by deposit between the individual muscle fibers, and by its extra weight. In the abdomen the fat interferes with the action of the diaphragm, the principal muscle of respiration, thus tending to cause improper oxygenation of the blood. Since to supply the extra fat with nourishment more blood-vessels and a larger volume of blood are needed, in all these cases a high blood pressure is found unless there is cardiac dilatation. This means extra work for the heart to do and gives rise to cardiac hypertrophy with danger of dilatation and cardiac insufficiency. The excretory organs may become congested and in many cases albumen may be found in the urine, which suggests nephritis. Apparently, also, waste products of metabolism may be retained in the blood and give rise to various nervous symptoms, rheumatic and neuralgic pains.

All grades of cardiac insufficiency may be seen in this class of patients, but the most satisfactory and suitable cases for reduction treatment are those in which slight disorders of the



circulatory system are present and in which there is a moderate degree of obesity; cases in which the first signs of circulatory disease are beginning to appear. In some cases an increasing shortness of breath after slight exercise has been noticed; in other cases the only complaint may be pain in the region of the liver, gastric disturbance, or frequent nocturia, which Strauss has shown to be one of the earliest signs of beginning cardiac weakness. These cases are easily recognized, and a little physical exercise will show that the reserve force of the heart is becoming exhausted. Patients of this class are very common among our prosperous business and professional men and in women of middle age in all classes of society.

The indications for prophylaxis and treatment in this class of cases are clear and distinct. The disproportion between the fuel value of the food taken and energy output of the body must be righted, so that gradual reduction in weight will result and the work of the heart be lessened. For many years the dangers of excessive fat in acute illness have been recognized, even by the laity (as in the prognosis of acute infectious diseases, pneumonia, etc.), and Oertel has shown long ago the advantages resulting from the therapeutic measures directed toward a gradual reduction of excessive weight.

There are many who consider any attempt at reduction as weakening. This may be true of many of the "fast cures" which are extensively advertised in the popular magazines, and depend, as a rule, on purging and large doses of thyroid for their success. That it is not true of the slower method by proper diet is attested by the statements of patients who repeatedly say they feel stronger each week. In fact, if such is not the case, it is a sure indication that there is something wrong, and some feature of the case needs more investigation. The body depends largely on the proteid content of the food for its repair and growth. In the slow reduction by diet, proteid is usually allowed in amounts of 100 grams, or more, unless there are complications present, such as nephritis, when a moderate reduction may be made, if indicated.

In all these cases, without dilatation, as stated before, a high blood-pressure is found, and the question arises, what will be the effect of the reduction treatment on this? I can answer that the steady fall of blood-pressure is one of the most marked features as the patient improves. Conversely, where there is a low pressure resulting from the cardiac dilatation, the systolic pressure will rise gradually.

The greater the excess of weight, the greater the demand on the heart becomes and the smaller the surplus of reserve force to meet any unusual demand on the circulation. This is true, not only in cases of organic heart disease, but also in all conditions which impose

increased work on the heart, such as arteriosclerosis, atrophic nephritis, emphysema, etc. As a rule, it is impossible to exercise any direct effect on these lesions, but in obese cases we can combat the obesity and thus save the heart considerable extra work. This enables it to devote all its energy to overcome the disastrous effects of the pathological condition present.

There are several "cures" or systems of diet in obesity which are generally known by the names of their authors. Among the more important and widely known are, The Harvey-Banting Cure, the Epstein Diet, Oertel Cure, Schweinger System, and v. Noorden's System. While differing in several particulars, principally in the various proportions of fat, carbohydrate and proteid, and in the amount of fluid allowed, still in all the principle is the same,—to reduce the total caloric value of the food taken so that the excess body fat may be used in supplying this deficiency, while protecting the general nutrition of the body. In using any set system there is always danger of trying to adapt the individual patient to the diet rather than adapting the diet to the individual's needs.

At first glance it would seem as if the technic of arranging a proper diet would be most difficult, because of the formidable array of figures representing the various percentages of food elements and caloric values. Of course a knowledge of the composition and caloric value of the more common articles of diet is necessary, but in practice it is not necessary to weigh each article and compute its caloric value and the approximate amount of fat, carbohydrate, and proteid contained in grams.

It is easy to work out some simple system so that the total caloric value of the diet is reduced, and so long as care is used in treating the individual patient so that the general nutrition does not suffer, the desired result may be attained. The patient should report at the office each week to be weighed, and the effect of the diet on the weight and general nutrition noted.

In mild cases which apply at the office for treatment a careful inquiry should be made as to the kinds and quantity of food which constitute the average daily ration of the patient. In practice I have found it advisable to have the patient keep a list of the kinds and amounts of food taken for a week and bring it to the office. Then a proper diet should be made out for that patient. In many cases all that will be needed is a slight modification in the diet, such as a limitation in the quantity of bread and butter, pastry, etc. In other cases a more strict diet will be needed. It is not the purpose to make the diet so strict that it will be tiresome to the patient.

Considerable variety should be given to the action of the bowels, as proved by the increased use of vegetables, containing from 2 to 15% of carbohydrate. Many vegetables contain



than 5% COH and can be ignored in the caloric reckoning, as the little starch content goes through the bowels with the vegetable fiber, thus escaping absorption. If these are boiled in two waters the percentage of carbohydrate is considerably lowered. The restriction in the amount of bread and butter is usually most complained of by these patients, who are, I have found as a rule, excessive bread eaters. It is my custom to allow a moderate amount of potato and to insist on at least two other vegetables, to overcome somewhat the hardship resulting from the restriction in the amount of bread. It is generally believed that potato is fattening, but that it is markedly less so than bread is readily seen when we consider its analysis. Average bread consists of P. 9, F. 1.5, COH 53.3, while potato contains P. 2, F. 0.1, COH 18. By this method the coöperation of the patient is secured, and by the time the weight has been reduced to normal limits the habits of eating have been so changed that there is little danger of former habits being resumed and the weight regained, as so frequently happens when treated under the artificial surroundings of a sanatorium where a comparatively few weeks are spent.

In severe cases with œdema absolute rest in bed should be insisted upon for one to three weeks or longer. The heart rate is slowed when the patient is lying down, and as the heart receives its blood supply during diastole, better nourishment of the heart muscle results. The blood-pressure is also lowered. If the patient is restless and the heart action rapid and tumultuous, tincture of opium should be given in 5-10 drop doses as required, as it slows the heart's action and secures rest for the patient. Sufficiently large doses of digitalis may be given to secure its physiological effects if indicated, the amount of urine excreted in 24 hours being carefully noted, since as long as this amount is increased, or at least not decreased, no accumulative action need be feared. The diet at first should consist of skim-milk, cooked fruits, and eggs. When the condition has improved the diet may be increased by adding solid food at short intervals, bearing in mind that the food must be carefully selected as to quantity and quality, so that no overloading of the digestive organs may result. As a rule, it is best to limit the fluids to the skim-milk, which in itself is a mild diuretic. It should be given in small amounts frequently. When immediate danger is past, a rigid reduction diet should be prescribed so that a rapid reduction may be obtained, for if this favorable opportunity is allowed to pass, renewed cardiac attacks may be expected soon. In the beginning a loss of 3.5 pounds a week may be obtained, but as soon as the good effects of this become evident the diet should be rearranged so that only 3.5 pounds a month are lost. After a few months' treatment more freedom in diet should be allowed.

the aim being to retain the present weight for a few months. Then the diet should be again restricted so that a gradual loss of weight results. This method should be persisted in until the weight normal for that individual is reached. This may be a few pounds over or under weight as given in the various insurance tables.

The beneficent results of this method of treatment have been especially noted by the author in preventing the first signs of cardiac weakness in the slightly obese; in all cases suffering from diseases entailing an increased burden upon the circulatory system; and in the cases of extreme obesity. This is a particularly good field for prophylaxis, and it should be considered one of the most important duties of the family physician to prevent the development of obesity in all cases in which he recognizes cardiac weakness, as, for instance, valvular trouble developing from some of the acute infections of childhood, and in families which show an hereditary tendency toward obesity.

The following case reports from my cases are given to show the type of cases and results obtained by this method of treatment in suitable cases.

CASE 30. Female, married, age 39, house-wife. Feb. 5, 1914.

F. H. Negative.

P. H. Muscular rheumatism five years ago, which has persisted off and on ever since. Has had during the last twelve years four attacks of "nervous prostration." Legs have swollen for a long time when she is on her feet. Said to be due to "internal varicose veins."

P. I. For the last year has been very short of breath and at times gets weak and trembles. Has to sit down. Says she feels tired all the time. Has been treated for a long time for sour stomach and gas with no relief. Complaints of pain in right side under lower ribs. Nocturia three to four times. Bowels constipated. Menstrual periods regular. Flow small and pale.

Average Diet. Breakfast—cereal, bread and butter, cup of hot water. Dinner—potato, meat, bread and butter, pudding or pie. Supper—bread and butter, cake or cookies. Considerable candy between meals.

P. E. Height, 5 ft., 3 in.; weight, 183 pounds. Pulse, 80. B.P., 120. Obese. Eyes, nose, and throat, negative. Lungs, negative. Heart enlarged, apex 1 cm. outside left nipple line; at apex and base a soft systolic murmur is heard; not transmitted to left. Liver edge just below costal margin; tender. Both legs show marked edema to just below knees. Urine, pale, sp. gr., 1020; alb., 0; sugar, 0; sed. neg.

Diagnosis. Obesity; myocardial weakness with dilatation. Congestion of liver and other internal organs.

Treatment. Rest in bed; diet (skim-milk, eggs, and cooked fruits), until edema disappears. Then patient allowed up and strict reduction diet prescribed.

Outcome. July 21, 1915. Weight, 137½ pounds. Feels fine and has no shortness of breath, pain in side, or stomach symptoms. No nocturia. Walked to-day from her house to office, a distance of 1½ miles.



CASE 50. Female, married, age 60, house-wife; seen Jan. 18, 1914.

*F. H.* Father died of heart trouble, mother dead, age 65, cause not known; one brother living and well, one sister living but has heart trouble, one brother died of asthma and dropsy.

*P. H.* Has always been well until within the past four or five years, when she began to have a cough and frequent attacks of bronchitis; scarlet fever, mumps and pertussis as a child.

*P. I.* Comes in because of cough which has persisted most of the time for four or five years and is much worse at present. Raises considerable white sputum but never any blood. Cough is worse at night and whenever she gets tired. Has been moving the past week and has done considerable extra work. At present has some distress in stomach, and at times considerable gas. Distress not made worse by eating and is relieved by rest. Has noticed that she is growing more short of breath recently. Appetite good. Bowels are regular.

*P. E.* Weight, 182½ pounds; height, 5 ft. 5½ in. Pulse, 80. B. P. (s), 140.

Head, neck and throat negative.

Chest—Lungs show many "wheezes" and a few râles, mostly at the bases, posteriorly.

Heart—Area not determined because of excessive fat. First sound, faint and short. Soft systolic murmur at the apex. Action regular but somewhat rapid.

Abdomen—Full, soft, no masses or tender areas.

Liver edge felt about three fingers below costal margin.

Spleen not felt. No fluid.

Ext.—Moderate edema of lower legs.

Urine—Sp. gr., 1020. Alb. s. p. t. Sugar, 0. Sed. negative.

*Diagnosis.* Obesity; myocardial weakness with dilatation; chronic endocarditis (?); congestion of the liver.

*Treatment.* Rest in bed until edema is gone.

Diet (skim-milk, eggs, cooked fruit).

*Outcome.* Jan. 16, 1916. Weight, 155 pounds. B. P., 160.

Feels fine and has no cough or dyspnea. Has had no swelling of legs for several months. There is a moderate systolic murmur at the apex of heart, much more distinct than at first examination.

CASE 42. Male, age 52, salesman; seen Sept. 10, 1914.

*F. H.* Negative.

*P. H.* Has always been well except for pneumonia about 39 years ago; good recovery.

*P. I.* Comes in because of shortness of breath which has been growing worse for the last three to four years. Recently has had more cough, which is worse at night unless head is high. Any exertion makes breathing worse and is very apt to cause coughing. Thinks ankles have swollen a little lately. At times raises considerable sputum, and once or twice thinks he has seen little streaks of blood. Appetite good. Bowels are regular.

*P. E.* Weight, 177½ pounds; height, 5 ft. 6 in. B. P., 200. Pulse, 77.

Head, neck and throat negative.

Chest—Thorax moderately emphysematous. Lungs show a few squeaks scattered throughout both sides.

Heart—Area enlarged to the left and right. Regular and sounds distinct. At apex a systolic murmur is heard which is transmitted to the left.

Abdomen—Negative.

Urine—Sp. gr., 1022. Alb. s. p. t. Sugar, 0. Sed. negative.

Ext.—Slight pitting on pressure, over tibia.

*Diagnosis.* Obesity, emphysema, chronic endocarditis, nephritis (?).

*Treatment.* Reduction diet.

*Outcome.* March 20, 1916. Weight, 147 pounds. B. P., 164.

Feels fine and has no cough or shortness of breath, except on vigorous exertion. Cardiac area and sounds unchanged.

CASE 35. Female, married, age 49, house-wife; seen Oct. 18, 1915.

*F. H.* Father dead, accident; mother dead, child-birth; two brothers and one sister living and well.

*P. H.* Has had six children, all normal labors; has had frequent and severe attacks of tonsillitis all her life; scarlet fever, pertussis, measles in childhood.

*P. I.* Comes in for shortness of breath and swelling of legs which began about eight years ago and has steadily increased despite varied and vigorous treatment.

*P. E.* Weight, 183½ pounds; height, 5 ft. 3 in. Pulse, 80. B. P., 180.

Head and neck negative. Throat shows large and ragged tonsils, the crypts of which are filled with cheesy material. Pillars reddened.

Chest—Negative except for poor expansion.

Heart—Area enlarged; blowing systolic at the apex transmitted to the left. Regular and moderately rapid.

Abdomen—Liver edge felt about two fingers below costal margin.

Ext.—Marked edema of lower legs.

Urine—Sp. gr., 1028. Alb. s. t. Sugar, 0. Sed., rare hyaline cast.

*Diagnosis.* Obesity; chronic endocarditis; cryptic tonsils.

*Treatment.* Removal of tonsils advised but refused.

Reduction diet.

Rest in bed until edema gone.

*Outcome.* Feb. 10, 1916. Weight, 159½ pounds.

Feels fine and has no edema of legs; no shortness of breath; walked to-day from her home to office, a distance of about one mile, easily.

CASE 54. Female, married, age 58. One child. Nov. 27, 1914.

*F. H.* Father died of heart trouble, dropsy. Mother died of kidney trouble. One sister living, Bright's disease.

*P. H.* Always has been well except for attacks of severe colic which began about six months after birth of child, and has recurred at intervals ever since.

*P. I.* Comes in because of shortness of breath which has been increasing for the past few years. Has considerable regurgitation of serum. Latter fluid into mouth. Appetite is good. Body emaciated, has been gaining in weight considerably for the past few years.

*P. E.* Weight, 199½ pounds; height, 5 ft. 6 in. B. P. (s), 210. Pulse, 117.

Head, neck and throat negative.

Chest—Negative.

Heart—Area enlarged to the left and right. Regular and sounds distinct. At apex a systolic murmur is heard which is transmitted to the left.



Abdomen—Liver palpated about two fingers below costal margin. Slight distress in region of gall-bladder.

Ext.—Moderate edema.

Urine—Sp. gr., 1020. Alb. s.t. Sugar, 0; Sed., many hyaline and granular casts.

Diagnosis. Obesity, chronic endocarditis; chronic nephritis, gallstones (?).

Treatment—Rest in bed, reduction diet. Epsom salts as required to keep bowels active.

Outcome. March 24, 1916. Weight, 163 pounds. Breathing fine, still has considerable stomach distress at times. Heart area and murmur unchanged. Urine examination, many hyaline and granular casts. Edema of legs. B. P., 180.

## JEAN-PIERRE DAVID: THE MAN WHO POTTED POTT.

By JOHN RIDLON, M.D., CHICAGO.

IN the BOSTON MEDICAL AND SURGICAL JOURNAL of June 3, 1915, Dr. R. W. Lovett presented an appreciation of "Percival Pott: His Times and His Work."

Pott lived when "quackery was rampant." If we may judge him by his paper on "Palsey of the Lower Limbs, Which is Frequently Found to Accompany Curvature of the Spine," he did not escape the taint of his times. Then, as now, a quack may become preëminent; then, as now, a learned and skillful practitioner of medicine or surgery may become preëminent; but the learned and skillful practitioner of medicine or surgery who happens to be born with the instincts of a quack has all others out of the running.

In his time Pott was counted a skillful surgeon—"Surgeon to St. Bartholomew's Hospital during forty years." His writings on hernia, head injuries, hydrocele, fistula in ano, and fractures and dislocations, have been forgotten for more than a century; the three things that have come down to us, after 138 years, are: that he broke his ankle going to Southwark; bought a door and had himself carried home on it; and wrote the paper above mentioned on palsy of the lower limbs, which gave his name to caries of the spine, of the treatment of which he appears to have been profoundly ignorant.

The knowledge which Hippocrates had 400 B. C., the knowledge which Galen had in the second century and the knowledge which Paré had in the sixteenth century, A.D., and the work which was then being done in Paris all passed him by.

It is generally supposed, and often stated, that Pott first described Pott's disease. Nothing could be further from the truth. He did not even describe the disease in his paper on palsy. He does not appear to have recognized any difference in the causative effect of kyphosis, scolio-

sis and lordosis on the production of the palsy, or to know that there is such a thing as caries of the vertebrae, or that it had really anything to do with the palsy he writes about. All he appears to have aimed at was to get his new method of treatment into print before any other practitioner heard of it and forestalled him.

And what was this wonderful treatment? It was to cut a gash or burn a hole in the meat on each side of the spine, place therein a kidney bean, and every third day, sprinkle into the wound some finely powdered Spanish flies to ensure keeping the sore open and discharging abundantly! He ignored the fact that this treatment kept the patient in bed, and kept him lying on his face in the most favorable position for the cure of the caries of the vertebral bodies. He does not even give a good clinical description of the palsy (see Lovett's quotations). He was sure that the arms were never affected, and he recognized sensory disturbances, particularly in the thighs, before any motor disturbances appeared. He did not know that the reflexes were changed.

He recognized an early enlargement of the vertebral bodies and some change in their structure, but he does not appear to have recognized this as a diseased condition—only as a condition preceding caries. But when caries had developed, Pott looked upon the case as hopeless. He says: "That if from inattention, from length of time, or any other circumstances, it happens that the bodies of the vertebrae have become completely carious, and the intervening cartilages are destroyed, no assistance is to be expected from the proposed remedy." He unhesitatingly asserts that the placing of setons and issues at each side of the kyphotic spine will cause the kyphos to straighten, or at least become straighter, and the patient taller. To quote: "I have waited a sufficient length of time, and treated a sufficient number of subjects to be clear in the truth of what I have asserted as far as such time, and such individuals go. That the patients whom I have attended in the early part of the distemper, of whatever age, have all got well; that is, have all not only regained the use of their legs, but have become healthy and fit for any exercise or labor, as numbers can testify who have seen them daily. Most of them have become much straighter, some quite straight, and all of them perfectly free from all kinds of inconvenience arising from the curve." Again: "That as far as my experience goes, I have not the least doubt that if the means proposed be made use of before the bones are become really carious and rotten, they will always be successful. When, indeed, a truly rotten state of the bones takes place, no good is to be expected from this or from anything else; but it should be observed, at the same time, that this never happens but when the distemper is of very old date and when this is the case, the whole machine is disordered and the patient



is so truly and so generally distempered that there can be no reasonable expectation from anything."

The cry of Pott is the cry of the quack of all times: "I can cure all curable diseases by my wonderful treatment. Cases that cannot be cured by my treatment cannot be cured by any treatment whatsoever."

Now attend to what Jean-Pierre David, whose prize essay was published in Paris the year before Pott wrote, has to say regarding caries of the spine.

Discussing the rationale of the treatment of fractures by rest, he says: "But there are many other cases in which nature appears to have the same views as in fractures and in which the indications for rest are as precise as in these accidents."

His first case of "Pott's disease" (!) he saw in 1766, and describes as follows: "Having been violently beaten, at the age of 13, by his father, he felt, a few months after, a weakness in the spine, attended with pain and difficulty in keeping the upright posture. He walked with great difficulty, and afterwards could not walk without leaning upon a stick, with his body bent forward. These first symptoms, which continued for more than six months, were followed by a fever accompanied with difficulty of breathing, and pain in the middle of the back, without any apparent swelling externally.

"These symptoms were relieved by bleeding and other remedies and the patient seemed restored to his former state, but the difficulty of walking and supporting himself increased by degrees, and at length a tumor was formed toward the lateral and posterior part of the last false ribs, the increase of which was very slow, and made no change in the colour of the skin.

"This tumor, extending itself, gained the region of the loins, and more than six months after its appearance, the skin became inflamed, grew thin and, by the assistance of maturing poultices applied to the tumor, a fistulous opening was made in it from which there issued, according to the patient's account, more than a quart of matter as white as milk. The discharge having continued very plentiful for three months without hope of cure, the parents, tired with the length of the disease, took the resolution of sending the young lad to the Hospital. When he came there he had a fistulous opening on the right side of the lumbar region which furnished an ichorous and plentiful discharge; a slow suppurating fever accompanied, and every appearance seemed to show that death would soon terminate this disorder. A plectet of soft ointment only was put upon the fistulous orifice, and the disease was left to nature.

"I frequently saw this patient, who, being better fed and more attended than at home, began to recover a little from the deplorable state to which he had been reduced. He particularly kept very quiet in his bed, and his spine

was then incurvated with an evident projection outwards, towards the last dorsal vertebra. About two months after he came to the Hospital, the matter which oozed from the fistulous opening grew thicker and less plentiful, the countenance appeared better, the pulse less frequent, and he began to give some hope of recovery. This hope was confirmed six weeks afterward, for the discharge still lessened, and the patient began to feel some degree of strength in his spine. Two months after this last period, the fistulous orifice was closed, and the patient began to walk with a stick; but he was crooked, and seemed to have lost much of his former height.

"From the accidents this patient had undergone, and the deformity the spine had contracted during the course of the disease, I imagined that some of the dorsal vertebrae had been affected with caries; that the remains of them, after having been confounded together and after having been in a state of granulation, had at length acquired a degree of solidity sufficient, in some sort, to supply the bodies of these bones. I could not but consider rest as having been the chief promoter of this salutary end; and the subsequent facts appear to have completely confirmed my conjectures on this point.

"First, the patient who had been the subject of the preceding observation, and whom I had always kept within my notice, having been seized, in 1769, with a peripneumony of which he died, I was allowed to inspect the body, and my first care was to take notice of the disorders the spine had experienced three years before. I found, as I expected, several vertebrae, the bodies of which were confounded with each other; these were the ninth, tenth and eleventh of the dorsal vertebrae, which had lost at least half of their longitudinal dimensions, while their spinal processes, which had not suffered the least alteration, formed a projection and a remarkable convexity outwards."

David then goes on clearly to differentiate these cases of kyphosis from cases of lateral curvature, and to point out how those cases of kyphosis accompanied by abscesses never recover until "after a long continued rest," to enable the affected parts to gain "a sufficient degree of solidity." We should wait "till, by rest and a horizontal position, the pieces that compose the column shall have lost that morbid state of softness which has disposed them to be thrown out."

He then describes cases of spondylitis in the lumbar region with abscesses passing down underneath Poupart's ligament or into the iliac foramen.

As to the frequently accompanying abscesses he says, "The surgeon who makes this opening and who sees that he is giving rise to a great quantity of matter, confined for a long time to swellings of this kind, congratulates himself upon an event which he looks upon as



but turn out for the good of his patient; but the patient, who for some months past had experienced no evident degree of fever, who suffered but little, who had perhaps preserved his appetite, who slept, and who had complained of no other symptom but that he could not keep his back upright, is far from being relieved by this operation, at least if he be, the relief is not of long continuance; for the matter forming the tumor, which at the time of the opening was as white as milk and without smell, soon contracts a considerable stench, a fever comes on, the pulse becomes quick and small, and the patients pretty frequently die towards the thirteenth day."

David knew that these abscesses, when left alone, and the patient put at rest, would not infrequently disappear; and he reports such a case, a young woman with caries in the lumbar region, who had a psoas abscess with a tumor the size of one's fist below Poupart's ligament. Under treatment by rest the abscess disappeared without opening. He knew that so long as "the matter is still sheltered from the external air, and undergoing no change, produces no mischief in the parts surrounding it." He knew that the slow evacuation (by spontaneous opening) or absorption of the matter, "as slowly as its collection was formed, the parts which compose the cavity must return to their proper state as gradually as they were disturbed from it, without accident and without inconvenience."

"With respect to the bones that are primarily affected, and which have almost adopted the nature of flesh during the long and important process of exfoliation, no sooner are they disengaged from the loose pieces than they begin to recover their solidity; and if several vertebrae . . . . . have partaken of the injury, they form among themselves a common mass of ossification that in some measure supplies their bodies, and terminates this important cure, which, as we may observe, can only be the work of nature, time and rest."

And now after the lapse of 138 years, who has given, who can give, a more illuminating picture of spinal caries? As to the treatment of the disease, and its complications, we may differ from David and from each other in minor details, but the broad general principles of the treatment have in no way been added to or altered.

Placed side by side with Jean-Pierre David, the real man, Percival Pott, with his setons and issues, his kidney-beans and finely powdered cantharides, bulks very small and a very pathetic figure.

LONDON DEATH RATES IN JULY.—Statistics recently published show that the total death rate of London for July, 1916, was only 10.7 per 1,000 inhabitants living. Among the several districts and boroughs the highest rate was 14.8 in Holborn, and the lowest was 7.7 in Wandsworth.

## Clinical Department.

### REPORT ON THE CLINICAL SYMPTOMATOLOGY AND LABORATORY FINDINGS IN THREE CASES OF GENERAL PARESIS UNDER INTRAVENOUS ARSENO-BENZOL TREATMENT.\*

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Mr. President and Fellow Members of the Worcester District Medical Association:

THE recent increase of literature on the subject of syphilis and its action upon the nervous system, together with the results obtained from the intensive treatment of salvarsan now being practised in our state hospitals for the insane and at a number of the larger general hospitals, suggest that a brief presentation of the history, symptomology and laboratory findings in three cases here under treatment for the past three months will be of interest at this meeting of the Worcester District Medical Society.

Most of the cases of central neural syphilis in this state are classified as general paresis. The percentage of admissions of this disease to our state hospitals for Massachusetts has been given at 9%.

Hitherto the diagnosis of general paresis has been made upon the appearance of such classical symptoms as the Argyll-Robertson pupil, altered knee-jerks, ataxia, loss of judgment, emotional instability, etc. The diagnosis was confirmed by the well known Wassermann reactions in the blood and spinal fluid.

We have come to look for the following six laboratory tests in confirmation of the diagnosis of general paresis:

1. Positive colloidal gold reaction of Lange (gold chloride test).
2. Globulin—present and increased, Noguchi—butyric acid method.
3. Albumen—present and increased.
4. Number of lymphocytes per c. m. increased from 10 to 400.
5. Wassermann reaction in blood serum.
6. Wassermann reaction in spinal fluid.

It is interesting to note that practically nothing is known of the reactions of the spinal fluid prior to the onset of the clinical symptoms of general paresis. Recent work by Southard and other observers, however, tends to show that the six positive laboratory findings for general paresis are present months, and perhaps years, before the appearance of the classical clinical symptoms. With these findings in view, spinal punctures, as well as the regular blood serum tests, are fast becoming routine procedure.

\* Read before the Worcester District Medical Society on March 8, 1916.



Moore, in his translation of Kraepelin's discussion of general paresis in the last edition of his text-book, states, "The actual beginning of paresis consists, as a rule, of rather indefinite symptoms which are usually interpreted as nervousness. They are apt to be excitability, a hasty, irritable, whining manner, anxiety states, absent-mindedness, fatigability, mental dulness, forgetfulness, a tendency to sleep or persistent sleeplessness. Accompanying these are headaches, migraine with scotomata and vomiting, giddiness, cardiac palpitation, excessive sweating, rheumatoid pains, numb feelings, muscle twitchings, writer's cramp, brief weaknesses, abdominal cramps and intestinal obstruction. In the further course, the mental and physical symptoms may progress collectively or individually with very irregular rapidity. Thus there are cases in which even severe disturbance of speech and writing, with tabetic signs and lost reflexes, may exist for a long time before any marked involvement of memory or intellect can be discovered. On the other hand, the mental symptoms may be fairly prominent while physical examination reveals at first only indefinite and non-characteristic changes. This fact furnishes a wide opportunity for errors in either direction, before the cytological, and especially the serological tests afforded us a means of verifying our opinion even in the earliest stage of the disease."

With these points in mind, I will briefly give the chief facts in the histories of three cases of general paresis now under treatment with salvarsan.

This treatment was recommended by the Massachusetts State Board of Insanity. As salvarsan was not on the market, the Canadian preparation, diarsenol, was used until the cheaper price of the Philadelphia Dermatological Laboratory's product, arsenobenzol, made its use advisable.

The drug has been given bi-weekly, intravenously, in the arms. Following the earlier treatments a distinct reaction occurred,—chills, fever, headache, nausea, and vomiting. The most constant symptom was a nervous chill lasting from ten to twenty minutes and appearing from ten to thirty minutes after treatment.

Some local infiltration and organization has been caused by leaking of drug during administration, but these discomforts have readily yielded to application of ice and massage. Some variability in the acidity of the drug has been noted. Frequent urinalyses have shown only occasional traces of albumen in ease of T. H. The body weights have shown scarcely any variation during the past three months.

CASE 29742. G. H. D. Patient is a French Canadian, age 38, white, single social state, Roman Catholic religion. In the United States 50 years. The family history states that the father died of accident, mother of shock at age of 72, one

brother of pulmonary tuberculosis, six sisters living and well.

*Personal History.* Early life unimportant. In school 11 years. Employed as a mill hand. Was steady and efficient, well liked, always well and enjoyed a happy disposition. Used alcohol moderately. Never arrested for drinking. Onset of present trouble began about Sept. 17, 1915. Complained about his heart. Returned medicine prescribed by physician to doctor claiming that the latter had drugged him. Later claimed that his relatives were drugging his food and for this reason stopped eating. Was hallucinated, talking to himself, saying that he could hear little fairies. Saw them flying around and sitting beside him. Regularly committed to the Worcester State Hospital, Oct. 4, 1915. Physician's certificate described him as both excited and depressed at times; as suffering from delusions of persecution. Claimed that members of the Lowell police force had been after him for six weeks; that a medicine with nine hundred and a half grains of poison had been given to him; that he had seen his death certificate signed, and that \$500 as a bribe had been offered to somebody to secure his death. Further described as troubled with insomnia. On admission to hospital, interview found him approximately oriented, with well marked ideas of poisoning, acute auditory and visual hallucinations for the past two weeks. These hallucinations were highly suggestive of alcoholic influence, and this fact, together with the admission that he had been drinking regularly three glasses of beer before, and perhaps from four to seven glasses after, supper daily, led to the diagnosis of alcoholic hallucinosis in a case of general paresis. In addition to the foregoing hallucinations, patient complained that he had a feeling that little fairies were about him—"they feel like little pin pricks"—suggested impairment of tactile sensations. During the earlier part of his residence he was very suspicious in attitude and seemed apprehensive of some harm coming to him. By degrees his hallucinatory episode abated, his attitude became more sociable and he adjusted himself to his surroundings, although remaining somewhat slovenly in his dress and habits. Following treatment of salvarsan he seemed to improve until February 22, when he flatly refused further treatment. A change in his conduct occurred on February 19, when he began to act peculiarly—appeared depressed, was noticed kneeling about the ward in attitude of prayer, was mute to all questions and would not cooperate with even such simple procedures as the taking of his temperature.

*Physical and Neurological Examination.* The skin showed copper point discolorations, entire body covered with papillomata ranging in size from a pea to a horse chestnut. Glands slightly enlarged in groin, axillary and cervical chain. Mucous membranes pale. Pupils unequal, right larger than left, right does not react well to light. Slight exaggeration of the deep reflexes; coarse, rapid, irregular tremor of extended hands. Percussion over impaired over bases of lungs positive. Slight atherosclerosis. Blood pressure 120. Very moderate posterior surfaces of scapulae. Scapular area on glans. Urinalysis negative. No albumen in urine. Menstruation normal. No other abnormal reflexes.

*Treatment.* T. H. D. Patient is a French Canadian, age 38, white, single social state, Roman Catholic religion. In the United States 50 years. The family history states that the father died of accident, mother of shock at age of 72, one



a. *Diarsenol.*

From January 5, 1916, to January 21, 1916, 6 intravenous injections (alternating arms) of diarsenol, given bi-weekly in doses varying from 0.3 gram to 0.6 gram—total of 2.7 grams of diarsenol.

b. *Arsenobenzol.*

From February 2, 1916, to February 18, inclusive, four intravenous injections (alternating arms) of American preparation, arsenobenzol, in doses varying from 0.3 to 0.6 gram—Total of 2.1 grams arsenobenzol.

Patient has steadfastly refused treatment from February 22 to present date. (Repeated punctures on account of small calibre of veins found necessary causing patient to grow discouraged and irritable. When told of his negative laboratory findings with idea of encouragement, he decided that he was cured.)

*Laboratory Findings:*

a. *Wassermann Reactions in Blood Sera.*

From October 13, 1915, to January 25, 1916, inclusive, 6 positive reactions reported by the State Department of Health laboratory.

February 7, 1916, negative reaction.

February 18, 1916, negative reaction.

February 25, 1916, doubtful reaction.

b. *Wassermann Reactions in Spinal Fluid.*

Nov. 10, 1915, positive reaction.

Feb. 17, 1916, unsatisfactory reaction.

c. *Spinal Fluid Examinations.*

1. Gold Chloride Test.

Nov. 8, 1915: 1-1-2-1-±-±-±-0-0-0—  
positive?

Feb. 14, 1916: 3-2-2-±-0-0-0-0-0-0—  
positive.

2. Cytological Count.

Nov. 8, 1915, fresh fluid clear—cells per c. m. equals 125.

Feb. 14, 1916, fresh fluid clear—cells per c. m. equals 3.

3. Albumen Test.

Nov. 8, 1915, plus, plus, plus.

Feb. 14, 1916, plus.

4. Globulin Tests.

Nov. 8, 1915, Ross-Jones test plus. Noguchi test plus.

Feb. 14, 1916, Ross-Jones test plus. Noguchi test plus.

CASE 29578, A. B. A man aged 36, Italian, in the United States 10 years. A waiter by occupation. Successful in business. Committed to the hospital on June 18, 1915. The committing physicians gave the onset of present attack about June 1, 1915, describing the patient as suffering from expansive and grandiose ideas (patient said he had about two hundred billion dollars and that he was going to give it to everybody that wanted it; that he was going to build restaurants and feed the poor people). Patient was further described as suffering from insomnia, excitement and talking garrulously. The family history states that one paternal uncle died of tumor of the brain. Patient is said to have been nursed by a woman who later died of syphilitic infection. The personal history credits the patient with little education, describes him as thrifty and saving, drank liquor moderately. Married April, 1914. One child born January 25, 1915. The onset of his present trouble is said to have been sudden,

occurring June 1, 1915, when he had some slight trouble with his employer, gave up his job, developed extravagant ideas, was talkative and excited and was sent to the Psychopathic Hospital, June 8, 1915.

On admission to this hospital he was noisy, excited, crying, showed loss of emotional control, hoarse from excessive use of voice, had a temperature of 101.2, pulse 90, respiration 20. Admitted contraction of syphilis about 20 years ago at Glasgow, Scotland, where he received treatment every week for a year, of mercury and potassium iodide. The doctor told him that he was cured. Five years later troubled with a sore upon his head; ten years ago in Boston, a right-sided bubo appeared and was treated surgically. Something over a year ago he desired to get married, and had his blood examined. A positive Wassermann was reported. He therefore took mercurial injections four times a week to the number of 106. The injections were given intramuscularly in the back; all of this treatment is based upon statements of the patient. In his capacity as waiter he claims to have accumulated \$12,000. About the middle of May, 1915, patient stated that he experienced a feeling of strange elation, thought that he would like to buy a theatre and wanted to buy everything to help humanity. Thought that the Boston Psychopathic Hospital was a present to him. During fifteen days he thought that he was boss and undertook to run the place. In his dreams he talked with his father and mother. During the next two months patient was highly excited, engaged in destructive acts, such as tearing his clothing and bedding, digging into the plaster of the walls of his room, taking the springs from his bed to make keys, successfully picked one or two locks, stole spoons and other metal articles to furnish material for his keys. During this period he required frequent sedatives to relieve noisy insomnia. Following this there was an improvement for about a month, followed by a relapse of two months. About January 1, 1916, he was transferred to Gage Hall 2, where he was a great trial to the attendants until he came under the influence of the salvarsan treatment. At the present time he reacts quite naturally to his surroundings and shows a remarkable general, clinical improvement.

A physical and neurological examination at time of admission showed some bruises and discolorations following violent activities preceding admission. General feeling of exaltation. Argyll-Robertson pupils. Irregular, rapid tremor of extended fingers, gelatinous tremor of the tongue margin. Some slight pulmonary changes. Blood pressure 150. A slight discoloration at coronal border of the genitals. Urinalysis was negative.

*Treatment.* Total arsenic drug equals 9 grams.

a. *Diarsenol.*

From Jan. 5, 1916, to Jan. 18, inclusive, 5 intravenous injections. Total, 2.1 grams.

b. *Arsenobenzol.*

From Jan. 21, 1916, to March 7, 1916, inclusive, 12 intravenous injections. Total, 6.9 grams.

*Laboratory Findings.*

a. *Wassermann Reactions in Blood Sera.*

From July 9, 1915, to Feb. 18, inclusive, 12 positive reactions reported by the State Department of Health Laboratory.

Feb. 25. Unsatisfactory reaction.

March 4. Positive reaction.

March 4. Positive reaction.



- b. *Wassermann Reactions in Spinal Fluid.*  
 July 16, 1915. Positive reaction.  
 Jan. 27, 1916. Positive reaction.  
 March 1, 1916. Positive reaction.
- c. *Spinal Fluid Examinations.*
1. Gold Chloride Test.  
 Jan. 24, 1916. 5-5-5-5-5-3-2-1-+-+-+  
 Feb. 28, 1916. 5-4-3-4-2-2-0-0-0-+  
 positive.  
 positive.
  2. Cytological Count.  
 Jan. 24. Fluid too bloody.  
 Feb. 28. Cells per c. m. clear fluid, 3.
  3. Albumen Test.  
 Jan. 24, 1916. Plus, plus, plus.  
 Feb. 28, 1916. Plus, plus, plus.
  4. Globulin Test.  
 Jan. 24, 1916. Ross-Jones test positive.  
 Noguchi, positive.  
 Feb. 28, 1916. Ross-Jones test, plus, plus.  
 Noguchi, plus, plus.

CASE 29461. T. H. A man aged 48, native American of Irish parentage. Plumber and professional baseball player by occupation. Civil condition, married. He was committed to this hospital on March 18, 1915. The physicians' certificate describing patient as cleanly, talking incessantly and boisterously, ideas of exaltation, expressing queer moral and religious ideas, marked insomnia, with "hallucinations of business deals." The family history is negative to insanity. The personal history furnishes a record of excessive use of alcohol from age of 19 to 43. Successful in his business. Married six years ago. No children. Had reputation for drinking and carousing while in baseball company. Generous and jolly in disposition. Venereal history unknown. The onset occurred about March, 1914. Began with nervousness and insomnia—six months ago considered taking a rest for nervous breakdown. Talked about big business deals. Eight days ago became excited, talkative and his conversation showed repetition. A physical and neurological examination showed a geographic tongue; right naso-labial fold more marked than the left. General feeling of well being. Pupils are equal and regular, but react sluggishly through a small arc to light. The right hand grasp is a little stronger than the left. Walks on a wide base. Reflexes exaggerated throughout. Knee-jerks third degree. Slight radial sclerosis. Blood pressure 148. Pyorrhea alveolaris. No genital scars. Urinalysis negative.

In the early part of his hospital residence, he was noisy, loud talking, distractible, generally excited and garrulous, showed pressure of activity, restlessness in his room, lack of judgment, rambling and boastful in conversation, full of explanations which failed to explain. Later he quieted down but remained emotionally unstable, with impaired judgment, tendency to fabrication, talkative, voluble, expansive and grandiose in his ideas. Admits venereal infection about six years ago.

On May 18, he was recorded as reacting to auditory hallucinations, talking to imaginary friends outside of his window. Disoriented for time, excited, elated, at times aggressive and violent, requiring the use of sedatives. By November, 1915, he had quieted down and had gained sufficient self-control to live in Lincoln 1.

*Treatment.* Total arsenic drug equals 8.7 grams.

From Jan. 5, 1916, to Jan. 21, inclusive, 6 intravenous injections. Total, 2.7 grams.

b. *Arsenobenzol*.

From Jan. 25, 1916, to March 7, 1916, inclusive, 11 intravenous injections, total 6 grams.

### Laboratory Findings.

a. *Wassermann Reactions in Blood Sera.*

From Jan. 6, 1916, to Feb. 5, inclusive, 8 positive reactions reported by State Department of Health Laboratory.

Feb. 7. Negative reaction.

Feb. 18. Positive reaction.

Feb. 25. Unsatisfactory re

March 3. Positive reaction.

March 4. Positive reaction.

#### b. Wassermann Reactions in Spinal Fluid

March 24, 1915. Positive reaction.

March 3, 1916. Positive reaction.

c. *Spinal Fluid Examinations.*

1. Gold Chloride Test.

Jan. 24, 1916. 4-4-3-4-4-3-2-1-=-= positive.  
Feb. 28, =-±-1-1-±-0-0-0-0-0-0-weak positive.

## 2. Cytological Count.

Jan. 24. Spinal fluid too bloody.

Feb. 28. Cells per c. m. in fresh fluid, 6.

### 3. Albumen Test.

Jan. 24. Plus, plus, plus.

Feb. 28. Plus, plus.

#### 4. Globulin Test.

Jan. 24. Ross-Jones, positive. Noguchi test, positive.

Feb. 28 Ross-Jones, plus. Noguchi test, plus.

Briefly summarizing the foregoing three cases:

1. The onset of the disease, as determined by statements of physicians, relatives and of the patient himself, occurred as follows:

In one case, ten days prior to commitment,

In another case, fifteen days prior to commitment.

In still another, one year,

In the light of subsequent treatment, early diagnosis of general paresis, or at least of syphilitic involvement of the central nervous system, is of the utmost importance. Other observers, as I have already tried to point out, have shown that a much earlier diagnosis can be reached through persistent and thorough laboratory examinations than from the appearance of consistent clinical symptomatology.

Following treatment:

2. Definite clinical improvement has occurred in two of the patients. One patient has shown resistiveness and lack of cooperation to such an extent as to classify him as not improved.

### 3. Definite results in the laboratory findings

a. Gold chloride test, although still positive, much reduced in two cases. Slightly increased in the case referred to treatment.

b. Allman tests reduced to 10 + 10 cases from three phases to one phase.

Calculation tests as well as the trend in



- one case; unchanged in other two cases.
- d. Cytological count reduced in one case from 125 to 3 cells per c. m. Low normal count in both of the other cases (3 cells in one, 6 cells in the other).
  - e. Wassermann reaction in spinal fluid: In one case from positive to unsatisfactory—Nov. 10 to Feb. 17 (case of G. H. D.). In other two cases unchanged, remaining positive.
  - f. Wassermann reaction in blood sera: Showed three negatives and one doubtful reaction in one case (G. H. D.). One unsatisfactory reaction in case of A. B. One negative, one unsatisfactory, and all other reactions positive in case of T. H.



### Medical Progress.

#### ELEVENTH REPORT OF PROGRESS IN ORTHOPAEDIC SURGERY.

BY ROBERT B. OSGOOD, M.D., ROBERT SOUTTER, M.D.,  
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(Concluded from page 314.)

#### RICKETS (Continued).

LOVETT<sup>26</sup> has made a careful study of between 600 and 700 roentgenograms of rickets taken from between 7000 and 8000 roentgenograms at the Children's Hospital, Boston. Thus rickets constituted about 9% of their total plates. We give a fairly complete review of this article, which seems to us of much value. In this study he found the cases divided themselves into three groups or stages, with fairly well marked characteristics. Of the first stage there were two types: 1. The mild type, in which the ends of the diaphysis become frayed out, instead of clear cut, and the epiphysis casts little or no shadow, while the centre of ossification is small or absent, and at times appears multiple. The whole joint is surrounded by a hazy cloud, and the diaphysis on the whole contains less lime than normal. Up to this point deformities have not begun. 2. In the severer type the epiphyseal appearances are similar, but more marked. In the diaphysis severe general bone atrophy exists, and there is pronounced periosteal thickening associated as a rule with fracture of the bones, most often in the arms. These cases of multiple fracture are very common. In the second stage the shadow of the epiphysis becomes more marked. The area is ragged and irregular about the margin and calcification is more marked at

some points than others, which results in a characteristic mottled appearance. The ends of the diaphysis begin to broaden, especially on the side on which the strain is greatest, which produces a ledge or lip next to the epiphyseal line. In bow-legs this is found on the inner side of the tibia and femur, and in knock-knee on the outer side of the same bones. The diaphysis in the second stage begins to give a more definite shadow. The region next to the epiphysis is striated longitudinally and is the area of maximum disturbance. At the epiphyseal end of the shaft there is generally a transverse area of increased density reaching about a quarter or a half inch from the epiphyseal line, bounded at the end farthest from the joint by a fairly sharp line. This continues into the third stage, in which it may become more defined, and resembles in many respects similar changes in syphilitic bones in infants, described as osteochondritis. At the end of the diaphysis next to the epiphyseal line, there often appears in the late second or early third stage a clear transverse white line, showing an increased deposit of lime in the lower end of the shaft. This is apparently not to be distinguished from the "white line" which is described as characteristic of scurvy, but which is equally characteristic of rickets. A longitudinal change occurs along the shaft of long bones, consisting of cortical thickening on the concave side of the bones. This is one of the most important characteristics in differential diagnosis. Further changes in this stage consist in "chambering" of the interior of the bone, where light areas in the shaft indicate the absence of marked bone deposit and heavier lines of ossification show the irregular development of trabeculae. In the third stage the epiphysis is more normal in contour and density, the lipping of the diaphysis persists, and there is a consequent discrepancy between the diameter of the diaphysis near the epiphyseal line and the epiphysis. This relative difference in size is characteristic of the disease. The shaft becomes more dense, and its compensatory thickening on the concave side of the curvature persists. Under differential diagnosis, the author states that in scurvy, while there may be marked changes in the diaphysis, the epiphysis shows a clear outline. This, too, is true in chondrodystrophia fetalis, also in hereditary osteogenesis imperfecta. The roentgenographic diagnosis of rickets and congenital syphilis is the most uncertain. Here again the difference in the appearance of the epiphysis in the two conditions is most important. In syphilis the epiphysis is not clouded and its outline is clear, while there is in syphilis marked cloudiness about the joint, which is not the case in rickets. Extensive periosteal changes are common to the two diseases. In the severe type of acute rickets, severe periosteal thickening, very frequently associated with fracture, is found. Such periosteal disturbances diminish



with the progress of the disease and show no tendency to bone formation, such as is the case in the periostitis ossificans of syphilis. Moreover, fractures are rare in syphilitic infants. The irregularities in the medullary shadow of the shaft in syphilis are due to irregular increase in density. The irregularities in rickets are related primarily to diminished density. In the later stages of both diseases the occurrence of cortical thickening is highly differential. In rickets the thickening is endosteal in origin, and is always on the concave side of the curve, while in syphilis the thickening is periosteal or osteoperiosteal and is very uniformly on the convex side of the curve. Lovett considers that osteotomies should not be done during the active stage, but only when the epiphysis presents a rounded clear outline.

#### CONGENITAL DEFORMITIES.

##### *Anteversion of the Neck of the Femur in Connection with Congenital Dislocation of the Hip.*

Hibbs<sup>27</sup> calls attention to this deformity of the femur as a cause of failure to cure certain cases of congenital dislocation of the hip. He determines the condition by roentgenograms of the hip, one taken with the patella and foot directed straight forwards, and one with the limb internally rotated. To correct this anteversion, he does an osteotomy of the shaft in the lower third, and puts the limb up in plaster, with the lower portion externally rotated. When the union is complete he reduces the dislocation of the hip.

[Ed. Note.—The Editors believe that the anteversion does not often offer an actual obstruction to complete reduction, and although if this anteversion persisted it would make the reposition less stable, it has been their experience that with complete reduction and careful after-treatment in many instances it corrects itself.]

##### *Club-Foot.*

Cook<sup>28</sup> reports about twenty cases with good results from the removal of the bony wedge from the outer side of the foot. A sufficiently large wedge of bone must be removed, and it is also necessary thoroughly to rotate the front part of the foot to overcome the deformity. Cook keeps the foot in plaster for eight weeks and then uses a foot plate. He considers that the two cases in which a further relapse occurred were due to the insufficient amount of bone removed. He considers the operation is analogous to the work of a carpenter or cabinet maker.

[Ed. Note.—In adults this operation may often be necessary, but in children we doubt the wisdom of removing large wedges of bone. The results are likely to be bad several years later on account of the constant pull of the adducting muscles and the disturbance in growth. One must be careful not to over-correct, because to

make a valgus foot out of a varus is making an equally bad deformity. In adults who wish quick results the operation may be done with much satisfaction.]

#### FRACTURES AND DISLOCATIONS.

##### *Old Patella Fracture.*

Phemister<sup>29</sup> has made an interesting study of the problem which is presented in old fractures of the patella, where the resulting separation of the fragments is very great. It is difficult to get fractured surfaces together, and in some cases the intervening space must be bridged over in order to get a functional hold that may be used by the quadriceps muscle. A fascia transplant taken either from the outer side of the thigh or a pedunculated flap from the thinner portion just above the quadriceps tendon may be used for this purpose. The author recommends occasionally removing the insertion of the tendon from the tubercle of the tibia, but it is not generally advisable on account of the difficulty of securing an attachment higher up. Of course, all adhesions about the joint beneath the patella should be freed.

##### *Delayed Union.*

Henderson<sup>30</sup> has collected 181 cases of fracture of the long bones treated in the Mayo Clinic during the last four years. Sixty-one of these cases were treated for non-union. The operation to obtain union by the use of bone transplants was performed 31 times. This was found to give success in the large majority of cases, although the procedure was not infallible. It is, of course, of special importance that asepsis should be maintained, that an autogenous graft be used, and that it be carefully placed in assured contact with the fractured bones. The inlay method, as developed by Buchanan and Albee, is found much better than the medullary peg. This latter method does not give as firm support, and leaves in the centre of the bone a foreign body to be absorbed. Of the 31 cases, 16 occurred in the tibia. They were of average duration of 12 months, and seven of them had been previously plated. With a circular saw a piece of bone was removed from the flat internal surfaces of the bone and slid into apposition with the other fragments. In all but one of these cases the result was successful. There were seven cases of non-union of the humerus, and the three of these which afterwards were kept fixed in plaster casts showed good results. The cases which showed non-union he explains as follows: in the tibia on account of the use of a poor bone graft; in the humerus on account of lack of fixation; and in the femur on account of an insufficient size of the bone peg for fixation.

##### *Early Knee Motion in Fracture of Femur.*

Ansinn<sup>31</sup> has been impressed with the frequency with which stiff knees and atrophied



museles follow prolonged immobilization in fractures of the femur. He has devised an apparatus which allows early motion of the knee joint, and in 30 cases has been delighted with the results obtained. There was no trace of ankylosis of the knee joint, there was an almost entire absence of atrophy, and firm bony union was obtained in an unusually short time.

[Ed. Note.—The Editors believe attention should be called to this unfortunate and unnecessary sequela of prolonged immobilization in fractures of the femur. The old dictum that prolonged immobilization never stiffens a normal joint would seem not to be sound, unless we conceive the fracture of the shaft of the femur to produce joint changes. Restricted and painful motion in the knee delays very materially return of function in the limb, though union of the fracture may be firm enough to allow the guarded weight-bearing which favors complete solidification. Scudder's simple iron joints, incorporated in plaster at the knee and capable of being set at any angle, accomplish this same purpose well and prevent any lateral or rotary motion of the lower leg which would be likely to disturb femoral alignment.]

#### *Leverage in Reducing Dislocation.*

Cocher<sup>32</sup> has found a crutch with a long cross bar lever attached at its lower end, very useful in reducing recent and old dislocations of the shoulder, elbow, hip joint, and knee. The large amount of force, always under complete control, may be registered by a dynamometer, and as much as 170 pounds can be thus exerted without jar or shock. The necessity for counter traction is thus avoided.

[Ed. Note.—In the groin we should suppose considerable pressure might be fairly safely exerted, with no more dangerous result to be expected than skin rupture, but in the axilla care must surely be taken lest injury to the axillary vessels and nerves be produced.]

#### *Habitual Dislocation of the Shoulder.*

Selig<sup>33</sup> discusses the various methods which have been used in the treatment of habitual dislocation of the shoulder, and emphasizes the importance of the supraspinatus muscle, which immobilizes the humero-scapular joint and is most important for the function of the joint. Duchenne in 1885 first demonstrated that the supraspinatus was an elevator of the arm, and that, furthermore, its action is necessary in order to keep the head of the humerus in contact with the joint cavity while the arm is elevated. Selig believes that the habitual dislocation is mainly due to elongation of the tendon of the supraspinatus, and has worked out an operation (on the cadaver only) designed to give this muscle its normal power, and consisting in shortening the muscle.

#### *Dislocation of Knee.*

Ransohoff<sup>34</sup> reports a case of anterior and external dislocation of the knee (with rotation to

an angle of 90°), due to a fall of 48 feet. There was some interference with the circulation in the leg, although pulsation could be felt in both the dorsalis pedis and the posterior tibial arteries. The dislocation was easily reduced, and function at the end of six weeks was practically restored. Ransohoff says that this is only the third case of dislocation of the knee occurring in a large accident service during a period of twenty-seven years, and that only 250 can be collected from the literature.

#### POSTURE.

##### *Postural Albuminuria.*

Jeanneret<sup>35</sup> remarks that Stirling was the first to call attention to intermittent albuminuria in children in connection with the position of the body, and he styled it "postural albuminuria." Jeanneret declares that this is the best name for it, as neither the orthostatic nor the lordotic attitude ever induce it except in the predisposed. The extreme lordosis, which is induced by Rollier's pillow in heliotherapy of Pott's disease, is borne by children at Leysin over long periods without their developing albuminuria. Jeanneret has also examined other cases of extreme lordosis, and no albuminuria was observed in them at any time. In still further tests, he had all children at the Children's Hospital at Basel lie on Rollier pillows, but albuminuria was scarcely ever observed from the extreme lordosis thus induced. This was the more remarkable as the children in the hospital were all more or less debilitated. On the other hand, 20% of the children in school present intermittent albuminuria. Numerous tests were made in different cases. One child of eleven had no albumin, in bed with milk diet, none in bed on mixed diet, none after three hours of extreme lordosis induced with Rollier cushion, none playing in the garden, and none during one-half hour in the erect posture while she stepped from leg to leg or otherwise exercised the legs. Albumin, however, appeared in the urine in three minutes after the child stood erect in extreme lordosis and kept perfectly still. There was 1% the third minute, 2% the fifth minute, 3% the fifteenth, and 10% the thirtieth minute. Further tests confirmed the importance in the genesis of intermittent albuminuria of this factor, namely, keeping still with the body upright, when this factor was superposed on even moderate lordosis. Of 204 children examined, albuminuria could be induced by lordosis alone in only 3%, and by a change from the seated to the erect posture (orthostatism) only in 1/3%. Both together, the children not keeping still, induced albuminuria in only 1.6%. But the combination of lordosis, orthostatism, and muscular immobility induced more or less albuminuria in 49%. The findings in the various groups are listed in detail in twelve tables. They show that the restlessness of children responds to a physiologic demand, and that children should



not be expected to sit still in school. The school desk should be arranged to avoid inducing lordosis. Jeanneret explains the anatomic and physiologic conditions, with illustrations, which are likely to start the albuminuria, when in children the normal play of muscles and the local circulation are checked by keeping motionless.

#### *Orthostatic Albuminuria in Relation to Nephritis.*

Holst<sup>36</sup> examined post-mortem the kidneys of a youth of 16 who had had typical orthostatic albuminuria during the last five or six years, but who had been otherwise in normal health until he contracted "galloping tuberculosis" of the lungs. Not a trace of inflammation could be discovered in the kidneys. He reports also ten clinical cases in which orthostatic albuminuria was a chronic condition, but in which no tubular casts were ever found.

#### WAR SURGERY.

##### *Gunshot Wounds of Knee Joint.*

Berard and Barjaval<sup>37</sup> believe that expectant treatment in gunshot wounds of the knee joint is justified, provided the case is followed with constant attention by the same surgeon. The function of many joints may be thus conserved, and they have been impressed with the tolerance of the synovia to the presence of bullets or shell fragments. In four cases the projectile was well tolerated for over two weeks.

Lockwood,<sup>38</sup> on the other hand, though strongly urging conservatism in treatment of compound joint injuries, believes that: (1) All foreign bodies, whether metal or loose bone, should be removed from the knee joint at the earliest possible moment. 2. Perfect immobilization is absolutely necessary. Do not start passive movements too early, that is, not until two weeks after the inflammation has disappeared. 3. All necrotic and edematous tissue should be excised. 4. Capsule closed as soon as possible. 5. No antiseptics other than 2% formaldehyd to be introduced into the joint. 6. No drainage tubes against joint surfaces. Out of 60 cases 49 resulted in free motion, 3 in ankylosis, and the others in limited motion.

[Ed. Note.—These results are surely unusually good, and seem to show very definitely that the conservatism and detailed observation in compound joint injuries, which the Editors strongly recommended in a previous Report of Progress in Orthopaedic Surgery, is not only justified, but demanded.]

##### *Bridge Plasters in Treatment of Compound Fractures.*

It is interesting to see the increasing use of plaster-of-Paris casts in the treatment of the severe septic compound fractures, both as a temporary dressing, which gives the soldiers great comfort while they are recovering from shock,

as recommended by S  n  chal,<sup>39</sup> and as permanent and even ambulatory dressings, as advised by Aubert<sup>40</sup> and Lance.<sup>41</sup> Aubert has found them as useful in lesions of the upper limbs, even those including the shoulder, as in the lower limbs, and Lance, by including iron bridges, has left the leg accessible from just above the ankle to above the trochanter, using the pelvis and lower thorax as the upper fixed point.

[Ed. Note.—The adoption by some of the best French surgeons of this method speaks strongly in its favor, for our impression is that early in the war there was a more or less general prejudice in France against plaster of Paris in the treatment of these recent and suppurating compound fractures.]

##### *Artificial Limbs.*

Much careful work is being done at present on the problem of providing inexpensive and efficient artificial limbs or prostheses. The most interesting and valuable articles on the subject which we have seen are those of Dollinger,<sup>42</sup> Brekenfeld,<sup>43</sup> and Natzler.<sup>44</sup>

In order to meet the enormous needs for prostheses or artificial limbs, Dollinger, in his clinic at Budapest, has established a workshop in which he employs wounded soldiers as inmates. He started the workshop in March, 1915, with one man, and employs now [October, 1915, when the article was written.] 108. During these six or seven months more than 1000 artificial limbs and several hundred other orthopaedic apparatus have been made. He emphasizes the fact that patients with amputated legs learn to walk very quickly with their artificial limbs, provided they fit well. If they have been in bed for a long time it takes longer to learn to walk because of the weakness of the muscles, but even among these he has seen several with amputation of both thighs, learn to walk comparatively quickly with the artificial limbs. Dollinger goes into many of the details of his work, and his descriptions are well illustrated.

1. *Prosthesis of lower leg.* If it can be avoided it is better not to suspend the prosthesis by a pelvic belt, nor should it be held on the femur by anything constricting. The prosthesis is made over a plaster model, which is very carefully moulded over the condyles of the femur and tibia. Over this cast a steel plate is made, which is fastened to a leather cuff which is to reach up to the middle of the thigh. The weight-bearing is borne by the condyles of the femur and by the inner condyle of the tibia. The patient does not walk on his stump directly. A plaster cast of the good leg is made for comparison to determine the desirable length, etc.

2. *Prosthesis for amputated thigh.* In very fat patients, Dollinger uses for suspension the customary shoulder belt. In others, however, he suspends it on a girdle, which is carefully modelled over the pelvis, and which reaches about 3-4 fingers' width above the pelvis on the back.



Weight-bearing is, as a rule, not possible or advisable on the stump itself, therefore a kind of seat is constructed over a carefully-made model, in which the patient, as it were, sits on his ischial tuberosity. The model is taken while the subject stands upon the good leg, with slight head extension. A cast is made of nearly the whole trunk, the stump, and the good leg. 3. *Protheses for amputated hands and forearms* are modeled in a way similar to those for the lower leg, that is, over the distal end of the bones of the forearm and the condyles of the humerus.

Brekenfeld<sup>43</sup> describes artificial limbs used by Hoefftmann in Königsberg. After a great deal of experimenting, Hoefftmann has come to the conclusion that a solid foot piece, which, however, is not as long as the normal foot, is best. The jointed feet, as well as those constructed with a rubber pad, do not allow enough stability and safety, especially in going up and down stairs, and the patient loses confidence in his limb. The details of the construction must be seen from the original. During the present war the artificial limbs of Hoefftmann have stood the test in a most excellent manner. The author describes the case of a captain in the army whose femur was amputated, and who is now doing full field duty with an artificial leg made in the workshop of Hoefftmann's clinic.

Natzler,<sup>44</sup> who is an assistant of Riedinger in Würzburg, emphasizes the importance of making for substitutions of lost arms or parts of the arm, not artificial limbs which resemble the shape of the normal arm, but of making what he calls "workmen's protheses." It is important not to make these protheses for the arm too long, but a good deal shorter than the normal arm measurements. The illustrated descriptions of patients who do full duty as mechanics, show how useful these simple apparatus can be,—indeed, much more useful than more elaborate artificial arms and hands.

#### *Wounds of Peripheral Nerves.*

Stoffel<sup>45</sup> believes that the neurolysis (*i.e.* freeing nerves from adhesions, etc.) which is frequently indicated in wounded soldiers, should be undertaken only with a full consideration of the anatomical structure of the nerves. He advises repairing first the motor tracts, and only after these have been sufficiently repaired, the sensory tracts may be considered if it seems wise. The use of a sterilized magnifying glass is very useful. The improvement after neurolysis is sometimes very surprisingly fast. Stoffel has seen cases which showed the first traces of improvement a few days after the operation, though in the majority of cases it takes several months before function is restored. At all events, one should not excise the nerve in its whole continuity before one has studied the nerve tracts.

Stracker<sup>46</sup> reports about 225 operations on

wounded peripheral nerves which have been done between February, 1915, and January, 1916, in Spitzzy's hospital. The operations have been performed by Spitzzy, Erlacher, and the author. Of the 225 cases, 93 were resections; in 39 neurolysis was performed, in 15 a tubularization, and in 4 a grafting. It is of interest to note the great difference in the result after resections in the various nerves. Among 25 cases of resection of the radial nerve, 12 showed recovery of the motility; of 13 cases of the median, 4 recovered; of 13 cases of the ulnar, 3 recovered; of 12 cases of the sciatic nerve, 2 recovered; and of 21 cases of the peroneal nerve, 1 recovered. The results after neurolysis were much better. In some cases a distinct improvement was seen from a few hours up to a few days after the neurolysis.

#### MISCELLANEOUS ARTICLES.

##### *Preventive Orthopaedic Surgery.*

Hardouin<sup>47</sup> has encountered a number of cases in which, after a bullet passed through the calf, the disturbances were so slight that the men were soon on their feet. The traction on the wound, however, caused pain, and in order to prevent this the foot was held in an abnormal position of actual talipes equinus, and as these men were known to be mildly wounded, they did not get the medical supervision of the other wounded. But the deformed attitude of the foot soon became permanent, and they were left cripples unless the deformity was noticed and corrected in time. If they were allowed to use crutches, permanent crippling was almost inevitable. Men with wounds in the legs should not be allowed to be on their feet until the wound is entirely healed. Disregard of this principle makes the healing drag for weeks longer than it should. When they are allowed to walk, the position of the foot should be kept normal, and it should be exercised only a very little at first. Massage is seldom useful, but a plaster cast may be needed in the grave cases.

[Ed. Note.—This observation of Hardouin's is entirely correct and represents one of the great advantages of preventive orthopaedic surgery. The value and economy of this type of anticipatory treatment, based on a knowledge of the sequelae of neglect, can hardly be over-emphasized, and the emphasis should be placed by orthopaedic surgeons.]

##### *Persistent Sciatica Relieved by Förster's Operation.*

Mettraux<sup>48</sup> reports the case of a man of 30, who had suffered more or less from a left sciatica for five years, and whose pain for the last six months had become agonizing, totally incapacitating the patient, and rebellious to all measures, including treatment for syphilis. As a last resort, Förster's operation was proposed, and in October, 1914, through an incision from the second lumbar to the first sacral spinous



process, from 1.5 to 2.5 cm. of the second sacral posterior root and the fifth lumbar were resected. Tamini, of Buenos Aires, has demonstrated that the last large root of the cauda equina is the second sacral root, and that this second sacral root is only half the size of the first sacral, whose diameter is the same as that of the last lumbar roots. The second sacral was thus easily located, and not more than 25 c.c. of spinal fluid was lost during the operation. The patient was kept lying prone for 24 hours, and the stitches were removed on the eighth day. There was then pronounced paresis of the left leg, but no single group of muscles seemed paralyzed, and motor functioning was gradually regained. Two months afterward the patient could take long walks without fatigue, and there has been no return of the pain, and the sciatic is not tender. The patient is said to be "enchanted with the result." Along the back of the thigh and the inner margin of the foot the sensibility is reduced, and there is an occasional burning sensation in the sole of the foot.

#### *Multiple Cartilaginous Exostoses.*

Ashhurst<sup>49</sup> has contributed an interesting paper on multiple cartilaginous exostoses. Cases showing numerous exostoses were described by Ollier in 1899, and mention was also made of them by Hawkins in 1837. Ehrenfried has recently collected 12 cases. The author reports 11 cases. He does not think that the exostoses are an essential feature; the irregular epiphyseal line is the more important characteristic. The epiphyses are small, misshapen, and the shafts of the bones curved. There are nests of uncalcified cells just beneath the periosteum near the ends of the shaft, which later develop into irregular growths which are almost always benign. They usually develop at an age of 12-16 years, and occasionally a second crop appears in later life. Certain of Ashhurst's cases showed definite exostoses developing without cause. Many, however, had a definite trauma, often slight, but still with a local lesion. While Ehrenfried believes the etiology is due to some embryological factor, as a faulty "anlage" for the development of bone, the author considers that these cases represent a certain type of chondrodys trophy, and that the exostoses are generally determined by other factors.

#### *Juxta-articular Sarcoma.*

Roberts<sup>50</sup> states that it is often the case that this type of tumor located in the vertebra or near the hip or knee gives symptoms which resemble pictures of tuberculosis. A careful study of the nerve symptoms and the influence of weight-bearing may differentiate these. Roberts considers the x-ray the most important means of diagnosis. The local pain and local tenderness and the deformity, which does not always correspond to the x-ray picture, are important elements in determining the nature of

the disease. Treatment by fixation often does not relieve the pain, and the absence of bony atrophy and abscesses are further points in differentiating it from tuberculosis.

#### *Pathology of Trench Frostbite.*

Smith, Ritchie, and Dawson<sup>51</sup> have conducted a very practical research into the experimental and clinical pathology of this condition. The exposure of the feet insufficiently clad is undoubtedly the cause of much of all foot troubles and adds to the discomfort of many patients with strained and pronated feet. This is a study of 51 clinical cases of soldiers returning from the front. They had been in the cold, muddy trenches, often in water up to the waist, and suffered from exposure to the rain, sleet and snow; conditions that are sometimes reproduced in the occupations of our laboring class. Most of the cases showed marked swelling, tenderness, sometimes local heat, and considerable disability. It was felt that the part played by tight boots and leggings had much to do with preventing proper circulation. Experiments made with rabbits showed very interesting changes, which offer some explanation of the course of the disease. The essential change in the feet when exposed to the severe cold consists in damage to the blood vessels. After an initial constriction of the vessels passes off, swelling of the feet occurs, while the circulation is being restored to its normal. Microscopically, there is shown a swelling of the lining endothelial cells of the vessels and destruction in the muscle fibres of the walls. Excessive fluid is poured out into the tissues, even though the walls of the vessels may not be ruptured. The resulting stasis interferes with the vitality of the cells in the surrounding connective tissue. Leucocytes and other phagocytic cells appear in the tissue, and a general chronic inflammatory process may take place. The nature of these changes clearly explains the slowness of the recovery. For this to be complete, there must be not only an absorption of the swelling, but a restoration of the vessel walls so that they can stand the strain of the changes in the circulation which take place when the patients begin to walk again; thus it is found that often when the swelling has disappeared, pain, tenderness, and disturbance of function still persist, and any application of extreme cold or heat is apt to bring back the symptoms. Experimentally, they also show the part that is played by pressure and constriction in predisposing the parts to the effects of cold. Very little has been written on the treatment of this condition, but Dr. W. J. Terrell, in the *Practitioner* for January, 1916, speaks of the value of electrical treatment and the use of high frequency in stimulating the circulation in some of these cases.

#### *Spontaneous Gangrene.*

McArthur<sup>52</sup> discusses the treatment of a spontaneous gangrene, termed "trophic gangrene."



itis" by Buerger, and "spontaneous gangrene of the young," by Koga. The condition in this country is almost exclusively found among members of the Jewish race. Mayesima had determined the constant high viscosity of the blood in all cases of gangrene, and acting on this, Koga confirmed Mayesima's findings and reduced the viscosity by diluting the blood with physiologic solutions (Ringer's). Cases which in the past would undoubtedly have been condemned to high amputation, he succeeded in curing by the simple expedient of hypodermoclysis of a sufficient quantity of Ringer's solution and over a sufficient period of time to reduce the viscosity of the patient's blood. McArthur says that the testimony of all those who have faithfully carried out Koga's recommendation verifies his claims.

### *Syphilis of the Spine.*

Whitney and Baldwin,<sup>52</sup> in a study of 100 unselected cases of syphilis, found 36 patients with sharply localized stiffness of a segment of the spine, the remaining portions of the spine being flexible. In these 18 showed hypotonicity. (By this term the authors apparently mean a lack of muscular tone and a laxness of the articulations, allowing freer motion than normal, chiefly in the lumbo-sacral region.) Among 25 patients with localized stiffness and less marked general stiffness, 11 showed hypotonicity. Among 7 patients with uniformly stiff spines, 2 showed hypotonicity. They conclude: (1) That a localized stiffness of the spine is strongly suggestive of syphilis. This was present in over half of this series, and rare in non-syphilitic cases. (2) That localized stiffness of the spine with hypotonicity of the uninvolved spine and the pelvis and hip joints, is almost pathognomonic of syphilis. (3) That a negative Wassermann reaction should not be interpreted as excluding syphilis in the presence of other signs which suggest joint syphilis.

### ORTHOPEAEDIC PREPAREDNESS.

At the annual meeting of the American Orthopedic Association, held in Washington in conjunction with the American College of Physicians and Surgeons, the matter of orthopaedic preparedness was brought up for discussion at one of the executive sessions. It was pointed out that perhaps no specialty in medicine had a possibility of being of more far-reaching usefulness than orthopaedic surgery. Judgment as to the efficiency of the locomotive apparatus of recruits, the prevention of deformity, the problems of immobilization of acute bone and joint injuries, the restoration of function, apparatus for the maimed, the organization of cripple industries, are all matters of peculiar orthopaedic concern. The present war has demonstrated these facts and also unfortunately shown how lacking in preparation along these lines most of

the European governments found themselves at the opening of hostilities. It is most desirable that in America, where orthopaedic surgery is well developed, some form of organization of the orthopaedic resources should at once be undertaken. A committee was appointed, of which Dr. Joel E. Goldthwait was made chairman, to consider methods and means. This matter was also brought to the attention of the Orthopaedic Section of the American Medical Association and a committee with similar aims was appointed, and in order that the two committees might work conjointly, Dr. Goldthwait was appointed chairman of this committee also. The attitude of the United States Government was next ascertained, and a most cordial approval of the plan and a promise of help was received. It seems to the Editors that this committee has an unusual opportunity for usefulness and a great responsibility. Already plans for an orthopaedic base hospital have been outlined, its necessary equipment studied, and the available personnel ascertained. This surely represents progress in orthopaedic surgery and in general medical preparedness.

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## Book Reviews.

*A Handbook of Infant Feeding.* By LAWRENCE T. ROYSTER, M.D., Attending Physician, Bonney Home for Girls and Foundling Ward of the Norfolk Society for the Prevention of Cruelty to Children; Physician-in-Charge of King's Daughters' Visiting Nurse Clinic for Sick Babies. Illustrated. St. Louis: C. V. Mosby Company. 1916.

The author states in his preface that the object of this little book is to furnish the essentials, and only the essentials, of infant feeding in a compact and succinct form for the use of the family physician and general practitioner. He follows, in general, the teachings of the Harvard Medical School, advocates the calculation of food mixtures in percentages of the various food elements, recognizes the part which bacteria play in the causation of diseases of the digestive tract in infancy, and emphasizes the value of the examination of the stools as a guide to diagnosis and treatment. His point of view is always sane and reasonable and his explanations clear and simple. This book should, therefore, be of great assistance to those for whom it is written, namely, the general practitioner and family physician.

*Urgent Surgery.* By FÉLIX LEJARS. Translated from the Seventh French Edition by WILLIAM S. DICKIE, F.R.C.S., and ERNEST WARD, M.A., M.D., F.R.C.S. (Third English Impression.) With 20 full-page plates and 1086 illustrations, of which 729 are drawn by DR. E. DALIENE and A. LEUBA, and 198 are from original photographs. Vol II. The Genito-Urinary Organs; The Rectum and Anus; The Strangulated Hernias; The Extremities. New York: William Wood and Company. 1915.

The second of Lejars' two volumes is a book of some 600 pages and, like its companion, is excellently printed, and profusely and effectively illustrated.

The work strikes the reviewer forcibly as a treatise on Operative Surgery, thinly disguised by the word "Urgent." Certainly, almost every operative method is considered, and usually adequately described, including such measures as perineorrhaphy, hematocolpos, operations for simple fracture of the patella and other simple fractures, wounds of nerves, etc. It is somewhat paradoxical that the work should not have been a little more complete, and described by a less restricting title.

The work strongly reflects the opinion and habits of the writer. Citations and quotations are few, very few indeed, from America. It is somewhat of a shock to read in the chapter on

Dislocation of the Hip, "This method, which was originally employed by Després père and afterwards systematized by Bigelow," and to discover that no mention is made of the inverted Y-ligament, either in print or in picture.

The descriptions are brief and accurate; the practice and operative methods at times seem strange to Americans.

The book is an admirable presentation of French views in operative surgery, very suggestive, and valuable as a reference.

*The Principles and Practice of Perimetry.* By LUTHER C. PETER, A.M., M.D., F.A.C.S., Illustrated. Philadelphia: Lea and Febiger. 1916.

This book ought to receive a warm welcome from ophthalmologists. As far as we know, there is no single volume in English on Perimetry. There is room for one, and Dr. Peter's work has admirably supplied this want. The book is full enough to be worth while without being tiresome. It is a systematic study of perimetry, its principles and practice. Various devices for taking fields are described, but the author devotes most of this part of his work to practical office methods, and many of us can learn something here. Anatomy, physiology and general pathology of the visual field are given space enough, while the second half of the volume treats of special pathology of fields. The field in functional nervous diseases is the subject of the last chapter. A bibliography, mostly confined to the last decade, is given and an excellent index.

*The Nose, Throat and Ear, their Functions and Diseases. A Treatise upon the Breath-Road, Food-Road and Accessory Organs.* By BEN CLARK GILE, M.D., Instructor in Otology in the University of Pennsylvania. With 131 illustrations. Philadelphia: P. Blakiston's Son & Co. 1915.

This is a book of 450 pages intended to give the more important facts of etiology, pathology and treatment of diseases of the nose, throat and ear. Many of these facts are well stated, but this is not always the case. For instance, in the brief chapter on laryngeal neuroses, the following assertions appear, "The nerves of the larynx are the superior laryngeal whose function is motor, and the inferior, or recurrent laryngeal which conveys motor and also sensory impulses." "The arytenoid and cricoarytenoid muscles are the adductors of the vocal cords." The modern theory that vaso-motor rhinitis is an anaphylactic reaction to certain proteins is entirely ignored. Ready reference is much impaired by the lack of subdivisions, making it necessary to refer constantly to the index. The book is brightened by an occasional descriptive exposition of frailties of human nature, both lay and medical. It contains no legends, and is an attractive manual more desirable than didactic notes for a student.



*The Mortality from Cancer Throughout the World.* By F. L. HOFFMAN. Published by the Prudential Insurance Company of America, 1916.

A readable statistical study is rare. This work is not only very readable, but also the valuable information gathered is set down in an interesting and concise manner.

The author recognizes the difficulties of gathering accurate statistics on a subject so variously termed as cancer, and states that he wishes his work to be considered subject to such necessary errors as one must encounter in such a broad work. The work contains in every chapter a valuable bibliography of the most important books reviewed, and often brief abstracts of these works are given in order to make the text more explicit. The menace of cancer is emphasized and proof brought forward to substantiate the recently expressed view that cancer is not only relatively, but actually, on the increase. The importance of a world-wide educational campaign is emphasized. Several chapters are devoted to such practical topics as the mortality of cancer in different occupations, cancer in its relation to life insurance, statistical studies of cancer in American cities and foreign countries, racial cancer, precancerous states, problems of recurrence, degree of malignancy of certain types and under certain conditions, the question of heredity, relation of cancer to other chronic diseases. All these are treated in an interesting but general way. The work contains about 200 pages of text and 600 devoted to charts and tables. It is a well-compiled, up-to-date and well-presented work, which must have involved great labor and is a worthy and valuable book of reference.

*The Endocrine Organs.* An Introduction to the Study of Internal Secretion. By SIR EDWARD A. SCHAFER, LL. D., D.Sc., M.D., F.R.S. Professor of Physiology in Edinburgh University. London and New York: Longmans, Green and Company.

In the summer of 1913 Professor Schafer delivered the Lane Medical Lectures at Stanford University. He took for his topic the organs of internal secretion. The lectures were published by the University, but in abbreviated form and without illustration, so the author has reissued them in the present volume.

The work consists almost wholly of descriptions of experimental and clinical observations. Conclusions are drawn cautiously or not at all, as is eminently proper in a field in which, on account of the rapid accumulation of data, conclusions are necessarily wholly provisional. The numerous excellent plates add greatly to the value of the book, as they do to its cost.

*The Involuntary Nervous System.* By WALTER HOLBROOK GASKELL, M.A., M.D., F.R.S. London and New York: Longmans, Green and Company.

To the serious student no form of presentation of any special subject is more satisfactory than an authoritative monograph. The publishers of the work here under review have made a feature of series of such monographs in various fields of science, and in so doing have conferred a great benefit upon students everywhere.

This work of Professor Gaskell's, prepared during the closing years of his life and published posthumously, is an epitome of a course of lectures on the sympathetic and allied nervous systems, given by the author year after year. It represents in very large measure his own contribution, since he took a prominent part in the development of our present conceptions concerning these portions of the nervous system, particularly in their earlier stages. Professor Gaskell was specially interested in the phylogenetic significance of physiology, and much of the value of this work lies in the discussions of the bearing of the facts presented on the principles of evolution. It is unfortunate that Professor Gaskell did not live to see the remarkable clarification of our views concerning the sympathetic system, that has resulted from the researches of Cannon and his students. No one would have appreciated more than he the significance of Cannon's correlation of the entire sympathetic system into an integer.

A valuable feature of the book is the bibliography, which covers 13 pages and includes all the important titles up to 1914.

*Blood Pressure.* Its Clinical Applications. By GEORGE WILLIAM NORRIS, A.B., M.D. Second edition, revised and enlarged. Philadelphia and New York: Lea and Febiger. 1916.

The first edition of this clinical text-book on blood pressure was reviewed in the issue of the JOURNAL for November 12, 1914 (Vol. clxxi. p. 755). This second edition is increased in size by the addition of new material from the constantly growing literature on this important subject; but the author has continued his endeavor to present this material in condensed and practical form. Whenever possible, a summary of experimental as well as of clinical data is included. In addition to the chapters on physiology and on venous blood pressure by Dr. J. Harold Austin there is appended a chapter on functional efficiency of the circulation, in the preparation of which Dr. Austin's assistance is also acknowledged. The number of engravings with which this edition is illustrated is increased to 102. It should continue to maintain its position of value as a presentation of the literary history of the subject and as a correlation of experimental data with clinical experience.



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## PROGRESS OF THE POLIOMYELITIS EPIDEMICS.

DURING the past week the various epidemics of poliomyelitis in the United States, though still active, have seemed to show a definite tendency to decrease. In New York City, on August 30, the number of cases reached a total of 7,986, with 1,911 deaths. In New York State, outside the city, the total of cases on that date was 1,620, with 166 deaths.

The second largest focus of the disease is in New Jersey, where the total number of cases has been 2,163, with 205 deaths. The other principal epidemics are in Pennsylvania, Connecticut, Massachusetts and Rhode Island. In Chicago there have been 85 cases; in Connecticut, 352. The northern New England states have been practically immune from the disease, there having been 14 cases in Maine, only 3 in New Hampshire, and none in Vermont.

The Massachusetts epidemic as yet has not attained the proportions of the two serious epi-

demics of 1909 and 1910. The number of cases of poliomyelitis in this state during the past eight years has been as follows: 136 in 1908, 923 in 1909, 845 in 1910, 232 in 1911, 169 in 1912, 361 in 1913, 151 in 1914, and 135 in 1915. The total of cases in Massachusetts in August, 1916, is 248, of which 221 have been in North Adams.

In the issue of the JOURNAL for August 24, we noted editorially the national conference of state and territorial officials which was held on August 17, in Washington, D. C., under the auspices of the United States Public Health Service, to standardize methods of combating poliomyelitis throughout the country. Representatives of 38 states were present at this conference, whose decisions related chiefly to the establishment of uniform interstate quarantine and travel restriction. It was decided that every child under 16 must have a certificate of travel without which it must not enter or leave the state of its residence. Any children entering another state without such a certificate are to be placed under quarantine. This certificate of travel is to state the name of the place from which the child is traveling, its intended destination, and the local prevalence of poliomyelitis. This certificate is not a guarantee of immunity, nor does it exempt its possessor from examination by a physician and observation for a fortnight in the place to which the child goes. It is hoped that the adoption of these provisions through the greater part of the United States will result in checking further extension of the disease and the establishment of new foci.

Following the Washington conference, a further conference of New England health officials was held in Boston, at which representatives were present from Maine, New Hampshire, Massachusetts and Rhode Island. These representatives were Dr. A. G. Young, Secretary Maine State Board of Health, Dr. Allan J. McLaughlin, and Dr. Eugene R. Kelley of the Massachusetts Health Department, Dr. Gardner T. Schwartz, Secretary of the Rhode Island State Board of Health, and Dr. Francis X. Mahoney and Dr. T. B. Shea of the Boston Health Department. This conference voted to permit, in New England, free passage of persons from any state through another, provided these persons come from uninfected houses or premises. Perhaps the only amusing feature in this present serious visitation has been the setting up at Chinatown, in Boston, of a large dragon whose presence, the residents believe, will avert the local incidence of poliomyelitis.



In the issue of the *Journal of the American Medical Association* for August 19, is published an important note by Dr. Simon Flexner on the serum treatment of poliomyelitis, to which reference has been made in recent editorials in the JOURNAL. Dr. Flexner summarizes the history of the serological study of poliomyelitis and the steps previously taken in the experimental serum therapy of the disease. Finally, he cites the work of Netter and Salanier, published in the *Bulletin of the Academy of Medicine*, for October 12, 1915, and the *Bulletin of the Medical Society of the Hospitals of Paris*, for March 10, 1916. In reviewing Netter's work Dr. Flexner says:

"Netter was the first to apply the data obtained by experiments on monkeys to the treatment of cases of epidemic poliomyelitis in men. He had published the results obtained in a small series of 35 cases which he regarded as highly favorable to the method.

"He employed the serum from cases of poliomyelitis in which complete recovery from the acute condition had taken place some time—even as long as 30 years—previously. The serum injections were given subdurally as soon after the appearance and recognition of the symptoms of poliomyelitis as possible."

The serum is, of course, sterile, and need not be inactivated. Its dosage is determined by the age of the patient and by the quantity of the serum available. Initial doses of from 5 to 20 c.c. may be employed and repeated several times at daily intervals, according to clinical conditions and indications. The effects of the immune serum are to be sought in checking the progress of the disease, that is, in the prevention or minimization of the paralysis when given in the pre-paralytic stage and in the arrest of its extension when given in progressive paralytic conditions.

"Since the immunity substances have been determined by neutralization tests to persist in the blood for many years, it is probable, as Netter has indicated, that persons who have passed through an attack of poliomyelitis many years earlier, may be utilized as sources of the serum. Reasoning from analogy it would probably be advantageous to prefer persons whose attacks were less remote so as to insure as high concentration of the immunity bodies as possible.

"In choosing the person who is to serve as the source of the blood from which the immune serum is to be derived care should, of course, be taken to secure a healthy donor."

Dr. Flexner's authority in poliomyelitis is

unique and with his endorsement following upon the successful results reported by Netter and Salanier it may be expected that serum therapy now offers the best, and perhaps a completely controlling, therapeutic measure in poliomyelitis.



## THE MEDICAL KNOWLEDGE OF CERVANTES.

IN last week's issue of the JOURNAL, we commented editorially on certain medical aspects of Shakespeare's genius, and briefly reviewed some of the recent literature bearing upon this subject. It should not be forgotten that this year is equally the tercentenary of the death of Miguel de Cervantes, to whose creative power we owe, in Don Quixote, a character almost the equal of Falstaff, and whose interest in medicine is reflected in many passages of his great work.

Doubtless in his case this interest was partly hereditary, for Rodrigo de Cervantes, his father, was a surgeon apothecary. Miguel himself, born in 1547, entered the Spanish navy, then the most powerful in the world and offering to young men an attractive career of adventure. It is narrated of him that at the Battle of Lepanto he lay ill of a fever aboard his ship, the *Marquesa*, but insisted on going above to fight. He received two gunshot wounds in the chest, and a third which permanently disabled his right hand. Perhaps his personal surgical experience at this time, and later as a Moorish captive, further increased his knowledge of the medical profession, upon which many Spanish authors have written.

In the issue of the *British Medical Journal* for May 20, 1916, was published the following editorial comment on the medical knowledge of Cervantes as evidenced in various of his works:—

"Cervantes mentions about a hundred plants, describing their medicinal and alimentary uses, and he is acquainted with the great compilation of Dioscorides on materia medica, at least in the Spanish translation of Andrés Laguna of Segovia, physician to Charles I (afterwards the Emperor Charles V) and Philip II. He had also read Pliny's *Natural History*, then held in Spain, as it was in England at that day, as of high authority on all things medical. He speaks of poisons which breed madness in men's brains, and discharges shafts of satire at druggists and doctors, but it is only pretenders and impostors at whom they are aimed.

"In more than one passage Cervantes scoffs at secret and superstitious remedies. When Don Quixote is losing blood after a fight, he re-



grets that he has not by him the Balsam of Pierabras, a medicine of such potency that if his body were cloven in twain, one part could be accurately adjusted to the other 'before the blood congeal,' when two draughts would make him 'sounder than an apple.' This balsam was believed to be a part of that used by Joseph of Arimathea to embalm the body of Christ. Elsewhere Sancho prepares for his bruised master a compound of simples, over which he says a number of Paters, Aves, Salves, and Credos, with many signs of the cross.

"Cervantes makes some unmistakable allusions to venereal disease. In *El Casamiento Engañoso* there is a description of an unfortunate officer leaving hospital where he had sweated away fourteen loads of buboes. In the same work mention is made of a disease called *lupicia* (alopeia) or *pelareta* (from *pelar*, to pluck out hair), treated by sweating, which makes all the hair, including the eyebrows, eyelashes, and beard fall out. The scene of the *Coloquio de los Perros* in the *Novelas Ejemplares* is laid in the Hospital of the Resurrection at Valladolid. In many places Cervantes dwells on the hygienic value of plain diet and moderation in eating. Delightful fun is made of the dietetic crank, Dr. Pedro Recio de Agüero, who stands beside Sancho when he is at table and condemns the various dishes set before him—one as being too moist, another too heating, and so forth, till the starving governor of Barataria threatens to knock him on the head with the chair on which he is sitting, saying that if he is charged with murder he will plead in excuse that he has rendered a service to God by killing a bad doctor.

"It was disease of the mind which most interested Cervantes, and Pi y Molist has written a book on him as a medical psychologist. If Cervantes does not bring so many mad folk before us as Shakespeare, he gives in *Don Quixote* the most finished picture in all literature of a certain type of insanity. Much reading of romances of chivalry had made the Knight of the Sorrowful Countenance mad. On all other subjects he was of good understanding and could discourse rationally. Cervantes speaks of hallucinations of smell which make the Don describe as an aromatic fragrance the odor diffused by his Dulcinea. He also refers to the loss of memory which makes the Knight exaggerate his adventures as caused by continual and extraordinary labors. The methods by which those about him seek to divert his mind from the exalted ideas which had led him to go about in search of adventures show that his creator had a clear notion of the value of moral treatment. The last illness of Quixote, in which he passes from madness to profound melancholy and recovers his reason with the onset of fever, may be compared with the death of Lear. Sancho Panza is an example of what Charles Lamb calls the 'twilight state of insanity, the madness at second hand, the contagion caught from a stronger mind infected.' In *El Licenciado Vidriera* Cervantes

gives a picture of madness brought on in a student of Salamanca by a love-philtre, such as is said to have caused the death of Lucretius. The young man imagined that he was made of glass from head to foot; when any one came near he would call upon him with terrible cries to keep away, lest he should be broken.

"In the 'Colloquy of the Dogs' we get a glimpse of the overcrowding of the medical profession in Cervantes' day. A student of Alcalá is quoted as saying that of the 5,000 students in that university 2,000 belonged to the medical faculty. The comment on this remark is that either all these doctors would require to have sufficient patients to cure—which would be a terrible disaster—or they must die of hunger. This makes one think of Abernethy's exclamation, on entering the crowded theatre of St. Bartholomew's on the opening day of a winter session: 'God help you, gentlemen! What is to become of you all?'"

#### A MATERIALISTIC VIEW OF MENTAL DISORDER.

*Mens sana in corpore sano* is a sufficiently euphemistic doctrine to be quoted frequently; this in spite of the fact that the exceptions are at least as prevalent as the rule. Those physicians who are attached to institutions for the insane know cases of men of magnificent physique who are imbeciles. These patients live sometimes to a ripe old age and when they finally die, say of Bright's disease or pneumonia, aside from the actual cause of death and some normal senile changes, no pathological changes may be found. On the other hand, how many absolutely healthy men physically do we meet daily? especially if we are thrown in contact with a class engaged in sedentary occupations. Every pathologist will tell you of the frequency of disease discovered only post-mortem. A normal kidney in an adult is a *rara avis* and we all have tuberculosis more or less.

We can sympathize with those investigators who seek for the causes for such mental disorders as dementia precox and the manic depressive group in physical disturbances, especially when they approach the subject in a scientific spirit and with an open mind; but attempts to correlate anatomical findings and mental symptoms which have little or no apparent connection are less open to sympathy.

The colon as the source of all evil appears again in the columns of the *Lancet* for June 21



Dr. Rupert Farrant reports results of his investigations on lunatics. His studies were particularly of the endocrinous glands, the colon and the faeces. As is the case in most English contributions to psychiatry, the terms used are the older ones, designating disease groups which have been later separated into component parts or merged into other groups with which they really belong, so that we are not always sure of an agreement even in essentials. Thus Farrant speaks of primary and secondary anæmia, acute confusional mania and melancholia. He also shows a tendency to be extremely indefinite in his statements as to what he really found. Thus he says, "In dementia præcox an alteration was found in the glands which varied with the duration of the case." He does not say the nature of the alteration,—what glands were involved, how these changes "varied with the duration of the case," what percentage of the cases showed such changes and how these changes compare with the condition found in the same glands in mentally normal individuals. His other statements are similarly general and his deductions therefrom are certainly open to question, especially in view of the data presented.

He states for instance: "Cases of dementia præcox exhibit a polyglandular syndrome and different gland types are to be found, and the appearances of the cases vary whether the gland is hypertrophic or atrophic." The only apposite statement which he had made before the generalization is this (besides the one quoted above).

"The pituitary gland was found sometimes to have given rise to symptoms of hyperpituitarism, to apituitarism in idioey, dementia præcox, and other forms of insanity."

Farrant concludes by saying that the treatment now becomes obvious, which it certainly does, providing only that the etiology is correct. He has started to work with a number of cases at the Bethlehem Hospital, beginning with medical and surgical treatment directed to the glands and the colon and, where the former have degenerated, glandular therapy is to be exhibited. We await his results with interest, but with pardonable pessimism. His theories of mental disorder have a familiar ring to them; they savor somewhat of the age when the conception that a physical condition could be due to a psychic cause was unconceivable, although then as now men are quite ready to admit a psychic effect of a physical cause.

## MEDICAL NOTES.

**PREVALENCE OF MALARIA PELLAGRA, SMALL-POX AND TYPHOID FEVER.**—The weekly report of the U. S. Public Health Service for August 18, states that during the month of July, 1916, there were in Arkansas 700 cases of malaria, 113 of pellagra, 45 of smallpox, and 64 of typhoid fever. During the same period there were in Wisconsin 52 cases of smallpox and 59 of typhoid.

**THE BUBONIC PLAGUE AT BRISTOL.**—Report from Bristol, England, on August 17, states that 3 cases of bubonic plague have recently occurred in that port.

**FUND FOR UNIVERSITY OF PENNSYLVANIA HOSPITAL.**—Report from Philadelphia on August 24 states that the University of Pennsylvania Hospital is to receive a fund of over three million dollars bequeathed in 1908 by Anna J. Jeans, for the treatment of cancerous, nervous and disabling disorders.

**HEALTH INSURANCE.**—Compulsory health insurance for wage-earners, which is now being strongly advocated in this country, is pretty certain to be given advancement by the adoption of the measure as a plank in the platform of the national liberal party of Canada, led by Sir Wilfrid Laurier. Compulsory insurance, with provision for contributions from the state, employers and employees, has already been established in Germany, Austria-Hungary, Russia, Great Britain, Holland, Norway, Rumania and Servia. The new Canadian plan includes maternity benefits. There is considerable expectation that the conservative party will follow the liberal lead and that legislation will follow soon after the war. A model bill for the United States has been drafted by the American association for labor legislation and will be introduced next year, the association announces, in 20 state legislatures.

**MIRAMICHI HOSPITAL.**—Report from Newcastle, N. B., on August 24, states that the new Miramichi Hospital in that city, founded by Mr. Ernest Hutchinson of Douglastown, was formally opened on July 1.

"It is the largest and most completely equipped hospital in the maritime provinces. The building is of Miramichi sandstone and has a frontage of 144 feet, with an average width, exclusive of verandahs, of forty feet. It is of three stories besides a full-sized basement, eleven feet one inch from floor to ceiling. Its furniture is of the best that could be procured and the sanitary arrangements are perfect. There is a Wappler x-ray machine with all the latest appliances. The sterilizer is a Bramhall Deane. The kitchen, staff's dining room, and x-ray and dark room, emergency room, boiler and fuel rooms, laundry, janitor's apartments, etc., are in the basement. The partitions and ceiling are all fire-proof.



The ground floor contains two public wards, male medical and female medical. These wards are each 24x28 ft. with twelve-foot ceilings, and contain six beds each. On this floor, to the right of the staircase and elevator, are the main office and the board of trustees' office, while to the left are the general waiting room and the nurses' parlor. Just across the hall is the matron's private room. The corridors are the full length of the central part of the building, and are divided from the wards by brick fire walls with self-closing fire doors, thus making three distinct compartments on each floor. In case of fire one may easily be closed from the other.

The second floor contains two public wards exactly like those on the ground floor, but which will be used as male and female surgical. On this floor, also, there are seven private rooms, each fitted with private baths and fireplaces.

All of these rooms have easy access to spacious verandahs, two stories in height, each floor being 16x33 ft., and overlooking the river.

The third floor is the home of the nurses, and contains the operating department. This department has all the latest conveniences and appliances, sterilizing and anesthetic rooms, etc. The operating room and the many bath rooms and toilets are fitted up with petrosilo floors and walls. The doctor's room has a shower bath and steel lockers. There are two fire escapes, one at each end, running from top story to the ground. There is an observatory on the roof."

THE SENATE COMMITTEE on Public Health and National Quarantine has reported favorably the bill to promote the efficiency of the United States Public Health Service. The bill has already passed the House of Representatives. The bill limits, according to the *Journal of the American Medical Association*, the appointment of the surgeon-general of the Public Health Service to commissioned officers in the service, not lower in grade than surgeon, and requires that the surgeon-general, at the expiration of his four-year term of office, be earned as an extra number in the grade of assistant surgeon-general, unless he be reappointed. As an inducement to physicians to enter the service, the bill provides for the promotion of assistant surgeons to the next higher grade after three years' service, instead of after four years, as at present. The chiefs of the bureaus of zoology, pharmacology and chemistry in the hygienic laboratory are to be commissioned by the President, by and with the advice and consent of the Senate, as professors of zoology, pharmacology and chemistry, respectively, and are to be entitled to leaves of absence as now provided by law for commissioned medical officers. Provision is made for the appointment of five additional professors, qualified for special work in sanitary engineering, epidemiology, pathology, anatomy, bacteriology, housing, or other matters that relate to the propagation and spread of disease. Men of this class, the committee's report,

says, often do not have medical degrees, and under the present system of commissioned service only doctors of medicine are provided for; and the bill will remove this defect and make places for men who are specially trained in these highly technical fields, but who are not graduates in medicine.

UNITED STATES PUBLIC HEALTH SERVICE.—Congress has recently made an appropriation for 33 additional Assistant Surgeons in the United States Public Health Service. These officers are commissioned by the President, and confirmed by the Senate. The tenure of office is permanent, and successful candidates will immediately receive their commissions.

After four years' service, assistant surgeons are entitled to examination for promotion to the grade of passed assistant surgeon. Passed assistant surgeons, after twelve years' service, are entitled to examination for promotion to the grade of surgeon.

Assistant surgeons receive \$2,000, passed assistant surgeons \$2,400, surgeons \$3,000, senior surgeons \$3,500, and assistant surgeon-generals \$4,000 a year. When quarters are not provided, commutation at the rate of \$30, \$40 and \$50 a month, according to the grade, is allowed.

All grades receive longevity pay, 10 per cent., in addition to the regular salary for every five years, up to 40 per cent. after twenty years' service.

Examinations will be held every month or so in various cities, for the convenience of candidates taking the examination. Further information will be furnished by addressing the Surgeon-General, United States Public Health Service, Washington, D. C.

#### EUROPEAN WAR NOTES.

A BRITISH RED CROSS UNIT IN SERBIA. Members of the American medical profession, who were interested last year in the work of Dr. Richard P. Strong and his Typhus Fever Commission in Serbia, will be interested also in a recent publication\* describing the simultaneous work in Serbia of a British Red Cross Unit. This unit was recruited from the Royal Free Hospital of London by Mr. and Mrs. Barry, both physicians, who commanded it. The story of the unit is summarized as follows by a reviewer in the *British Medical Journal*:—

"On arrival it was sent to the chief watering place of the country, Vrnjataska Banja, and given a disused hydropathic establishment and a school; 100 beds were at once established, but eventually the unit controlled six hospitals with 360 beds, and there was also a British Red Cross Unit in the town. The worst misfortunes of Serbia had not then begun, the chief and very serious danger was typhus fever. Consequently the first task was to improve the sanitary

\* *The Serbians and the British Red Cross Unit in Serbia*, by Mrs. Barry, London, 1915.



and destructors and to attend to the sanitary policing of the surroundings; fortunately Austrian prisoners were numerous and proved willing helpers. In his plans for the prevention of the dissemination of typhus fever Mr. Berry went whole-heartedly on the assumption that typhus fever is carried by lice and lice only, and the fact that the measures he took, though improvised and in some respects of a summary kind, were completely successful is important evidence of the truth of that theory. One of the hot springs was used for cleansing all patients admitted, and a state coffee-house near by was used as a receiving hospital, where patients were kept for a few days after the bath. On leaving the bath, the patient was given clean hospital clothes, his own having been taken away for disinfection—by boiling whenever this could be carried out without utterly destroying them, the remainder by sulphur fumigation. A wooden barrack was built for patients who developed typhus either in the receiving hospital or in the general hospital.

"When Serbia was overrun the members of the unit had the good fortune to fall into the hands of the Austro-Hungarians,—their actual guardians were Hungarians, by whom they were well treated, and eventually sent home by way of Switzerland. The book is a joint effort, to which several members of the unit have contributed one or more chapters, and is therefore unequal, but is interesting throughout, and the chapters by Mr. Berry and by Dr. Helen Boyle very well written. Many tributes are paid to the courtesy of the Austrian captors, and as an illustration of this, as well as for the light it throws on a principle of Red Cross law, we may quote the following passage (by Mr. Berry):

"In fact, our treatment by the Hungarians throughout our captivity bore out a little remark made to us once when we were discussing with a Hungarian officer our position as a Red Cross unit in enemy hands. He admitted that we were technically neither 'prisoners of war' nor 'interned.' In reply to the conundrum, 'Then what are we?' he answered, 'Let us say guests.' And as the Austro-Hungarian authorities supplied us with rations, left us our stores, and asked very little of us in return, 'guests' was perhaps a description not so very far wide of the mark."

HONORS FOR BRITISH SURGEONS.—It is reported that the British Military Cross for conspicuous gallantry and devotion to duty has been awarded to Dr. John Moir MacKenzie, who received his medical degree from Aberdeen University in 1915 and immediately entered the Royal Army Medical Corps.

"Though wounded in the foot and arm, he refused to go to hospital, and four days later, during a heavy hostile bombardment, he went up through the enemy artillery barrage, and attended many wounded men, though in considerable pain himself."

The Victoria Cross has been awarded to the late Dr. John Leslie Green of the British Royal Army Medical Corps for most conspicuous devotion to duty.

"Although himself wounded, he went to the assistance of an officer who had been wounded and was hung up on the enemy's wire entanglements, and succeeded in dragging him to a shell hole, where he dressed his wounds, notwithstanding that bombs and rifle grenades were thrown at him the whole time. Capt. Green then endeavored to bring the wounded officer into safe cover, and had nearly succeeded in doing so when he was himself killed."

HONORARY DEGREE FOR CAPTAIN KOENIG.—Report from Amsterdam by way of London on August 26 states that the University of Halle has conferred the honorary degree of M. D. on Captain Koenig of the German submarine *Deutschland* "for having broken the enemy's blockade, thereby enabling the German medico-chemical industry to recover its world position."

MAY A SOLDIER REFUSE TREATMENT?—There is now being tried before a court at Tours the case of a French soldier who refused to receive the electrical treatment ordered for him by his surgeon. In this case the soldier, a Zouave, set upon the surgeon and beat him with his fists. The real question is, however, whether a soldier has the right to refuse to accept treatment ordered by his superior officer. The decision of the court will be awaited with much interest inasmuch as the principle involved will affect thousands of individuals.

CANADIAN RED CROSS.—The recently published eighth annual report of the Canadian Red Cross records the work of this society during 1915 at home, in England, and in the several war zones.

"As regards the work in England, which is under the able direction of Colonel C. A. Hogdgets, C.A.M.C., the Duchess of Connaught Red Cross Hospital, in Major Astor's park overlooking the Thames at Cliveden, under the command of Colonel Gorrell, C. A. M. C., of Ottawa, has accommodation for 900 patients, and the King's Canadian Red Cross Hospital at Bushey Park for 300. The Peak Hydro, at Buxton, has been taken over by the society and converted into the Canadian Medical Services Special Hospital for rheumatism; and as the need was felt for more hospital accommodation for officers a house in Hyde Park Place, London, was obtained through Colonel and Mrs. Gooderham of Toronto, who paid for the equipment and alterations necessary to convert this residence into the Daughters of the Empire Canadian Red Cross Hospital; the cost of maintenance of this hospital has been undertaken by the Canadian Militia Department. The society has also given material assistance to a number of other hospitals and institutions in England and France and to the military hospitals established in







*German Relief Fund*—For German sufferers. Dr. Rudolph Hertz, 32 India street, Boston.

*Italian War Relief*—Lee, Higginson & Co., 44 State street, Boston.

*Jewish Relief*—Harry Fischel, 63 Park Row, New York.

*National Allied Relief Committee*—Lee, Higginson & Co., 44 State street, Boston.

*Polish Relief Fund*—To relieve the war sufferers of Poland. W. P. Blake, 27 Kilby street, Boston.

*Prince of Wales National Relief Fund*—For destitute non-combatants of England. R. M. Stuart Wortley, 25 Broad street, New York.

*Prisoners of War Relief (Teuton)*—Transatlantic Trust Co., 67 William street, New York.

*Prussian Fund*—Hubert Cillis, 50 Union Square, New York.

*Russian War Relief Fund*—For Russian war sufferers. Mrs. Curtis Guild, 124 Marlboro street, Boston.

*Secours National*—For the relief of the French women and children. Mrs. Whitney Warren, 16 East 47th street, New York.

*Serbian Distress Fund*—John F. Moors, 111 Devonshire street, Boston.

*Syrian Relief Fund*—Charles R. Crane, 70 Fifth Avenue, New York.

WAR RELIEF FUNDS.—On September 2 the totals of the principal New England relief funds for the European War reached the following amounts:—

Belgian Fund.....	\$150,177.49
French Wounded Fund....	115,523.94
Armenian Fund.....	66,461.10
French Orphanage Fund...	61,453.83
Surgical Dressings Fund..	45,206.37
Polish Fund.....	42,384.07
Italian Fund.....	21,712.54
Prince of Wales Fund....	14,526.74
Permanent Blind Fund....	4,358.81

#### MEXICAN NOTES.

RED CROSS PREPAREDNESS.—It is exceedingly gratifying to the American Red Cross to be able to announce to the public and its members:

That during the six months ending July 31, 1916, its membership has increased from about 27,000—which represented the growth of the society during ten years following its reorganization in 1905—to about 210,000,—an increase of nearly 800% in its membership in the last six months.

That in this same time the number of Red Cross chapters organized throughout the country has increased from 110 to 199.

That while up to six months ago practically nothing had been done towards organized Red Cross preparedness for furnishing volunteer aid to the sick and wounded of our Army and Navy

in time of war, during the last six months the personnel required for 25 base hospitals of 500 beds each for the Army have been selected and enrolled from among the staff of 25 of the largest and best hospitals of the country; that several Naval base hospitals which are about half the size of the Army base hospitals are now being organized; that funds for the purchase of equipment for 16 of the 25 Army base hospitals, costing \$25,000 each, have been subscribed, and that the purchase of the material for these base hospital units has been begun and the equipment as purchased is being stored so as to be ready for immediate use in case of need.

That in addition to this organization of base hospital units, the personnel required for two field columns, for transferring the sick and wounded from the transfer hospitals for the regular Army medical service to the Red Cross base hospitals, have been selected and enrolled from among the staff of two of the important hospitals of the country and \$10,000 toward the purchase of the equipment for one of these field columns has been subscribed.

While this really wonderful progress during the last six months is most gratifying to the American Red Cross, and while the Red Cross is more than glad to be able to extend its heartiest congratulations to all its members who by their interest and zeal and their united and untiring efforts have secured this progress, it firmly believes that this great showing and success should be but an added incentive to greater effort and greater success, if possible, in the future. For it should ever be remembered by every patriotic American citizen interested in humanity's cause, that even with this great stride to the front, the American Red Cross is still far behind the standard set by little Japan which with its 40 millions of inhabitants has a Red Cross membership of 1,800,000, with an endowment fund of \$13,000,000; while the United States with 100 million people has even now a Red Cross membership of only about 210,000, with an endowment fund of about \$1,000,000.

UNITED STATES HOSPITAL TRAIN.—Report from Chicago states that on August 15, the first hospital train built for the United States left that city for San Antonio, Texas.

The train, consisting of 10 coaches, has been built especially for army work, and is said to be as modern in equipment as the hospital trains now in use in Europe. It has a service or combination surgical car, which is in itself a thoroughly equipped operating room, six cars for patients, one standard Pullman, a combination baggage and library car and a kitchen.

RED CROSS BASE HOSPITALS FUND.—On Sept. 2 the total of the Massachusetts Red Cross Base Hospitals Fund reached the amount of \$81,745.25.



## NEW ENGLAND NOTES.

THE WEEK'S DEATH RATE IN BOSTON.—During the week ending August 26, 1916, there were 238 deaths reported, with a rate of 16.32 per 1,000 population, as compared with 201 and a rate of 13.94 for the corresponding week of last year. There were 55 deaths under one year as compared with 41 last year, and 63 deaths over 60 years of age against 42 last year.

During the week the number of cases of principal reportable diseases were: Diphtheria, 42; scarlet fever, 12; measles, 23; whooping cough, 19; typhoid fever, 5; poliomyelitis, 9; tuberculosis, 47. Included in the above were the following cases of non-residents: Diphtheria, 13; scarlet fever, 3; typhoid fever, 1.

Total deaths from these diseases were: Measles, 3; tuberculosis, 20; poliomyelitis, 6. Included in the above were the following deaths of non-residents: Tuberculosis, 3; poliomyelitis, 1.

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**Obituaries.**
**WARREN FISHER GAY, M. D.**

DR. WARREN FISHER GAY died suddenly at his home in Boston, August 26, 1916, at the age of fifty years. The son of Dr. George H. Gay, one of the surgeons to the Massachusetts General Hospital, he was born in Swampscott, July 24, 1866, and was educated at the Boston Latin School and at Harvard College where he was graduated A. B. in 1890. Receiving his M. D. from Harvard Medical School in 1893, he was a house officer at the Massachusetts General Hospital, joining the Massachusetts Medical Society at this time and settling in practice in Boston, at the close of his service. He became assistant surgeon to the St. Elizabeth's Hospital and to the Boston Dispensary, and later was on the visiting staff of the Massachusetts Women's Hospital and assistant orthopedist to outpatients at the Massachusetts General Hospital. He was a member of the Boston Medical Library, Winslow Lewis Lodge, A. F. A. M., St. Bernard Commandery, Knights Templar, Harvard Musical Association, New England Historic Genealogical Society, Society of the Colonial Wars and the Bostonian Society, and he belonged to these clubs: Tennis and Racquet, Harvard, University, and Harvard Club of New York.

On June 8, 1904 he married Ellen Freeman Stiekney, daughter of Dr. Josiah and Elizabeth Stiekney, who with an only son, George Henry Gay, survives him.

**ERNEST WATSON CUSHING, M. D.**

DR. ERNEST WATSON CUSHING died at his home in Boston, August 27, 1916, aged 69 years. The son of Thomas and Elizabeth Baldwin Cushing, he was born in Boston, January 17, 1847, was educated at Chauncy Hall School, of which his father was principal, and at Harvard College, receiving his A. B. in 1867. After spending two years at the Harvard Medical School he went to New York and took his M. D. from the College of Physicians and Surgeons of Columbia University in 1871. He studied abroad and while in Vienna, in the winter of 1873, married there, Maria von Ralenowski, returning to Boston the following year to settle in practice. At first he made a specialty of diseases of the nose and throat and he was connected with the Murdock Hospital on Huntington Avenue. From 1887 to 1903 he edited the *Annals of Gynecology and Pediatrics* and in 1890 translated August Martin's textbook on the diseases of women, becoming professor of gynecology at the Tufts College Medical School in 1894 and holding the position until 1913, when he became professor emeritus. The additional title of professor of abdominal surgery at Tufts was given him in 1897 and Tufts conferred an LL.D. upon him the next year. He was a founder of the Women's Charity Club Hospital, now the Massachusetts Women's Hospital, and was its chief surgeon from its inauguration until his death. He also established a private hospital near at hand to the Massachusetts Women's Hospital and there did a large amount of abdominal surgery.

Dr. Cushing was a member of the American Gynecological Society, the American Medical Association, the Massachusetts Medical Society, having been retired only last June, a fellow of the American College of Surgery and a trustee of the Robert B. Brigham Hospital from its inception. He was possessed of a retentive memory and was an accomplished linguist. He is survived by his widow and five daughters.

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**Correspondence.**
**IS IT WORTH WHILE?**

Mr. Editor:

Some years ago, more than enough for the interest if not for the recollection to have been erased from the memory of all but a small minority of the Massachusetts Medical Society, there was a tempest. From little heated active enough to excite a good deal of attention in the medical world as well as in the lay press.

Reminiscences of this abolition may be found applicable to some more recent changes which have been in the literature of a wider world.

I refer to the expulsion of several members from the older and larger Massachusetts Medical Society. The separation was accomplished with the best of good feeling, not hurting the victims, but upsets not even their best



mgs, pleasing the upholders of an ideal purity among the regulars and getting for that more conservative body a reputation for bigotry which it did not deserve and which it took years to outgrow.

These years have shown that homeopathic practice has been one among many means of disseminating more rational therapeutic views with but little reference to theories and not much more except business and perfunctory, to the name of the sect. In short, homeopathy has done a little good and some little harm in the progress of rational medicine; but rational medicine has made its steady advance with the general progress of biologic science, made practical by an ever increasing host of workers.

The official edicts of scientific societies are registrars of opinion rather than the leaders thereof. Not even high-sounding names of specialties—so easy to compound with the aid of a Greek dictionary—testify to any authoritative expression of opinion unless they have back of them the reputation and character of members with standards varying with their personalities. They are useful only as a crude classification.

Recently a multitude of utterances in professional and popular journals, based upon growing discontent with the present status of medical practice, have been brought to a focus in articles by a brilliant and candid member of this society and called out the reprobation thereof. The feeling was said to have been so strong as to have led to talk of expulsion. Fortunately this extreme action was not taken and it is to be hoped that the long vacation from committee meetings and perfunctory oratory will allow the effervescence to subside and that the time-honored teapot will continue to hold its residuum of truths only partly bitter and in part salutary. The righteous indignation against unkind sarcasm and unfair representations may well be left for cooler judgment and the effacing hand of time, while the society combines its efforts with those of the national profession of the United States and the intelligent laity in taking advantage of the useful suggestions.

These are not only not visionary or wild, but are in daily practice where circumstances are favorable. The group system of treatment is daily and extensively in practice in large hospitals,—is, in fact, indispensable. No intelligent hospital practitioner fails to feel the immense advantage, indeed the necessity, of being able to call upon his specialist colleagues in cases which he realizes do not belong to him, and no private practitioner who wishes to do his full duty to his patient does not regret that he cannot extend these advantages to persons of moderate means. One of the suggestions of Dr. Cabot's paper is to call attention or make practical the application to a large class without sending them on a tedious and expensive round of calls almost prohibitory to a large proportion of the community. It requires, however, but little ingenuity to suggest that combinations to accomplish these ends are fully within the scope of friendly cooperation.

Whether my colleagues, leading men in their specialties, who used to sit in their crowded clinics treating commonplace granular lids, plugged Eustachian tubes, hypertrophied tonsils, made more or less money than they would have accumulated by sitting in solitary state waiting for a stray millionaire, I cannot say, but these men earned the esteem of their fellows, which I sincerely trust profited them in the end.

The pessimists will say that we were all actuated by low and mercenary motives. I suppose, being human and cherishing mundane ambitions, we hoped to succeed, but there were some who, without making any pretence to absolutely disinterested philanthropy or general charity, were glad to drudge in these positions without immediate recompense. I speak of what I have seen, not of that of which I am any but a very small part, but I believe the best class of young men beginning the study of medicine are actuated by as high and worthy motives as those of the same class who are entering any career upon which they look as their professional life work. Medicine is too vast a

field to deny to any honest worker unlimited scope for scientific inquiry, and the practical side of it is worthy the devotion of the keenest intellect and of the most genuine good sense and good feeling.

Systematic social service, as incorporated in routine hospital work, is indeed a happy thought. Poverty and business embarrassments have long been recognized as factors of great importance in the development of many diseases, especially the psychic. Nobody can find fault with him who promotes the relief of these conditions in or out of hospitals. "Business efficiency" is most usefully promoted according to the tact of the promoter or the intelligence and good sense of the ward.

But the despised general practitioner has known these things for many generations and acted upon them in his crude way as opportunity has offered.

Larger questions than those merely of good taste, kindness of feeling, and professional courtesy are involved in the propriety of an official organization stamping its approval, or the reverse, upon the utterances of individual members. Such societies may take on in the eyes of the intelligent classes a certain responsibility greater than they deserve, but are more likely, on the other hand, to be looked upon with an indifference which under certain circumstances is almost criminal. It is not well for them to put themselves in any position which will deprive themselves of their due and proper influence on the right side.

Within its limits the aggrieved member has always the privilege of reply and any unjustly maligned class has usually no difficulty in finding spokesmen. Allegations of general incompetence can be met either with excuses and explanations or, on the other hand, with a "tu quoque" argument likely to become promptly an unseemly scandal. But an airing of medical ethical disputes involving delicate points of advertising is a direct play into the hands of those who can employ all the resources of the law in defeating that scourge under which the American people more widely, publicly, indecently, and ignorantly and criminally suffer than any other supposedly civilized community.

If the Massachusetts Medical Society could be reasonably accused of any wavering or half-hearted pursuit of any special form of vice, is it not certain that it would be claimed at once as favoring the moral concession, that we should be said to be lowering moral standards, abandoning the legal campaign against poisonous drugs, against criminal abortion, indecent and immoral literature, and bringing the pages of many of our medical journals to resemble indistinguishably those of lowest commercial types? It is true that problematic truths should be brought forward with circumspection, but public reprobation should not be wasted too easily on questions of etiquette and taste.

It seems to be impossible to eliminate the criminal practitioner. Nothing that medical societies can do is of any value except in upholding the strong arm of the law. Even the ignorant ignoramus must be gently, if firmly, dealt with. The friendly association of the better class into groups, the "team work," the good feeling of professional brotherhood not dependent solely on pecuniary relations are undoubtedly steps forward in purging the community of quackery.

But how much is surgery helped forward by the proclamation that there are men who do not know a cancer and who may, therefore, put off the saving diagnosis, or, on the other hand, be tempted to do an unnecessary operation for the sake of the fee? Is it not better that such men should learn, as they may easily do, that their more experienced neighbors would gladly help them for moderate fees or none at all, than that they should be publicly stigmatized as ignoramus? Is not the crudest cancer quack made more sure of his prey by the misrepresentations of the helplessness of his victims, or, on the other hand, the over-enthusiastic operator more likely to be stayed by the thought of the revision he may have to undergo at the hands of his more cautious and kindly senior?

ROBERT T. EDGS, M.D.

Springfield, Mass., Aug. 24, 1916.



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### Address.

## THE PORTRAITS OF FLORENCE NIGHTINGALE.\*

By MAUDE E. SEYMOUR ABBOTT, B.A., M.D.

McGill University, Montreal.

### INTRODUCTORY.

IT is nearly three quarters of a century since the name of *Florence Nightingale* first thrilled through Europe, plunged in the horrors of the terrible Crimean War. The details of her great and beneficent achievement have been forgotten by many, and in their full extent, indeed, have only been known by very few. Yet her name remains as a household word among us, breathing always the charm diffused by a life consecrated to high ideals, and symbolizing to us the power to move mountains of the passionate womanly sympathy, discerning judgment, and magnificent organizing genius, which together made her at once the Crimean heroine and the great reformer of military hygiene of the Victorian Age. Today we are again plunged into a war which has become even more terrible than any in the past, in consequence of the refinements of so-called civilization as applied to methods of modern warfare. But we have to thank the stream of military reform that set in after the Crimean crisis, so largely initiated and directed by the influence of Miss Nightingale,

that the care of the soldiers—wounded, sick, or well—has been placed at the present day on a very high plane of efficiency.

In view of the immensity of detail in such a life as that of Florence Nightingale, a complete account is impossible here. The most that can be attempted is a brief outline of those events that led up to, and followed the great Crimean climax, which revealed her to the admiration and affection of a grateful humanity. For further detail, those who are interested should consult the splendid *Life of Florence Nightingale*, by Sir Edward Cook, issued in two volumes, in 1913, by MacMillan and Company, London. The appearance of this book, from which the materials for this little sketch are drawn, has been an event in biographical literature. Based upon a thorough study of a mass of written records, including Miss Nightingale's own diaries and voluminous correspondence and many other papers, official and otherwise, not previously laid open to the public, it for the first time presents her story fully and fairly to the world, without sentimental exaggeration, but with the force of actual recorded facts. The story of the "Crimean Muddle," as the situation she was called upon to cope with in the East was picturesquely called, is told with fairness and discrimination, and the history of her activities, both then and in her subsequent life, is accurately detailed. As a result, we find the Florence Nightingale of our traditional knowledge replaced by a somewhat different, but a more human, and, we venture to think, a much greater character—one in whom the self-devotion and passionate tenderness of heart toward

\* Adapted from an Address on "The Work of Florence Nightingale and Medical Units in Active Service Today," delivered before the Harvard Historical Club, December 7, 1915.



the distressed, for which she has always been immortalized, were combined with an unswerving singleness of aim, a wide clarity of judgment, and immense powers of organization and execution that initiated and carried out far-reaching reforms. Her story, as here learned, is not alone that hackneyed theme, familiar to us all, of a gifted and gentle lady, who, moved with patriotic pity, braved the dangers of the seat of war for the sake of helping the distressed soldiers of a beloved Queen, and who became thereafter the popular heroine of the Victorian Age. The secret of her immense popularity and of the lasting greatness of her name has had a more logical foundation and a deeper root than could have been possible from the fruits of any single action. For in this case, as so often, *vox populi vox Dei est*.

From this new biography we learn that her life before that Crimean climax was one long struggling preparation and battling through of the many barriers raised alike by social prejudice and domestic affections towards the vocation that she felt was hers, though she knew not how or when it might come to her, but which, when it came, found her ready, with prejudices defeated, expert training secured, spiritually and mentally waiting for one of the great medical and military crises of the nineteenth century, that was to be hers to control and to subdue. Nor, after the crisis in the East was over, did she subside into the gentle inaction of an invalid chamber, as has been popularly thought, but from that chamber, battling with the physical illness that remained after her exertions in the Crimea, and that threatened her life many times, she proceeded unflinchingly to the solution of those many pressing problems by which medical science was revolutionized by her in various directions.

Had it not been for the absolutely Herculean labors of Florence Nightingale, invalidated in body, but of indomitable will, after her return from the Crimea, the terrible lessons of the war would have remained unlearned by the British nation, and the great reforms in the hygiene of the British army, sanitary science both in the East and West, hospital construction, and last but not least, in the profession of the gentle art of nursing,—reforms which she instituted, organized, and actually dictated to Court and Ministers alike,—would not have been carried out, and the many wrongs she righted would have remained for the sufferings of a later generation to retrieve. In the face of her prolonged illness, the heroism that struggled and won success for those reforms was on a higher plane than that by which she won the nation's praise at Scutari and Balaklava.

It is this new and immensely heroic presentment of her genius, so evident now that the true story of her life is unveiled to us, that I would endeavor to reflect here. In the words of a recent essayist, the Crimean episode, truly seen,

is only an incident in her career. Her title to rank among the great figures of history would have been as unchallengeable without that tremendous chapter. For her work was not passing, but permanent; not incidental, but fundamental.

#### THE PORTRAITS.

The series of portraits, which form an illustrative basis for this article, have been drawn from various sources, which are acknowledged below each. The writer's thanks are also due to the late Mr. J. B. Learmont, who made a collection of Nightingale memorabilia, and presented several of the fine engravings reproduced here, to various institutions in Montreal; to Miss Helen Desbrisay of the Canadian Nurses' Association for much valuable information; and especially to Dr. Harvey Cushing, to whose interest and through whose kind coöperation the publication of this article in its present form is due.

In the following paragraphs an attempt is made to group, under the periods in which these various portraits fall, a short biographical outline of the main facts, or rather factors, in the development of Miss Nightingale's character and work, and of their far-reaching results.

#### I. THE CHILDHOOD OF FLORENCE NIGHTINGALE.

(1820-1835. PLATES I AND II.)

Florence Nightingale was born in Florence, Italy, in the year 1820, during a winter's sojourn of her parents there. One of two only daughters of wealthy parents, she was brought up in all the luxurious refinement of the best type of English home, in the midst of a large and affectionate family connection, in an environment enriched by all the intellectual advantages and the happiness that such circumstances could bring. Born, as it may be said, a democrat, she quickly learned to discount the importance of these things in themselves, and yet her life was colored throughout by these early relations, which gave her, in the wide experience of suffering and distress that came to her in later years, a sense of proportionate values, and a capacity of taking herself and others for granted, that was one of the elements in her power, and that could probably have come to her in no other way. The rich English scenery, too, in which she lived throughout her childhood and girlhood days, and in which she revelled consciously, even as a little child, must have sunk deep into her observant and sensitive nature, and been to the great spiritual powers lying dormant there, as springs of water in a thirsty land. For there are few more beautiful homes and surroundings in England than the estates of Lea Hurst in Derbyshire, and Embley in Surrey, on which, with his family, Mr. Nightingale passed alternately the winter and summer months of every year.

The two sisters were the objects of much ten-



der personal care from their parents. Mrs. Nightingale was a woman who accepted and adhered strictly to the religious and social conventions of her day, but, within their limits, she was prompt and generous in the exercise of a philanthropy that devolved as a duty upon an Englishwoman of her means and position.

her childish diaries and letters contain naive comparisons and comments. She was a healthy child, fond of a frolic, and not free from unregenerate impulses towards unsympathetic governesses, yet, on the whole, serious-minded, and a little self-absorbed, with a tendency to introspection that sometimes verged upon the



FIGURE 1. MRS. NIGHTINGALE, AGE 40. (By J. M. W. Turner.)

From a portrait in the possession of Mrs. C. C. Nightingale, daughter of Mrs. Florence Nightingale.

Both her daughters were early permitted to share in their mother's solicitude for the poor of their father's estate, and to accompany her on errands of help among them. Such activities appealed especially to Florence, who quickly revealed her innate sympathy for the sick, philanthropic bent, and deeply religious nature. The contrast between the lot of rich and poor struck her then, as it continued to do with increasing force throughout life, as an incongruity, and

morbid, and an indication of weakness of her powers, that arose partly out of a conscientious knowledge of her own position, and partly from a natural sympathy, amounting almost to self-consciousness.

Her love for the poor was very strong, and she had a successful career in the nursing of the sick or well. The story of the injured soldier, long afterwards famous, was first told to her, and she was the first to suggest that he should be



broken paw, and which she tended under the guidance of the vicar, all one long summer day, until the prospect of healing was assured and the delighted shepherd acknowledged his right to live, is almost too hackneyed to repeat. But it is a true story, and is of interest, because it is intensely characteristic of a little girl who, many years later, refused to give up the lives

wonders if the adoring affection in the eyes of the gentle collie equalled the gratitude in the hearts of those poor wounded men!

Like many of his circle, for he belonged to that interesting Unitarian group among whom the Martineaus were so prominent, Mr. Nightingale held views on the higher education of women that were far in advance of his time.



PLATE II. FLORENCE NIGHTINGALE AND THE INJURED COLLIE DOG.

From an engraving in the possession of Miss White, Assistant Superintendent of the Royal Victoria Hospital, Montreal.

of the five Crimean soldiers who were pronounced "too far gone to be operated on." "Will you give me these men to do as I like with?" she asked of the surgeons as they turned away. And, the necessary consent obtained, she sat all night through beside them, tending their wounds and supporting them with food and stimulant, with such success, that when morning came, the surgeons, with surprised relief, were able to carry out what would earlier have been a useless task. One

He personally supervised the education of his daughters, himself teaching them, as they grew older, modern languages and classics, European and Constitutional History, and even higher mathematics. They wrote essays and analyzed philosophical treatises, pursuing much the same course of study, under his tutorship, as would be followed now for a university degree. Florence was an ardent and laborious student, arising often at four in the morning to carry out her preparations, and, as Sir Edward Cook



remarks, to her father's guidance in these ways she was undoubtedly indebted for the mental grasp and power of intellectual concentration that distinguished her work in later life.

Conscientious to a degree, imbued with a feeling of responsibility and a religious sense of self-dedication that developed in her very early years, absorbed in a round of studies, duties, and pleasures, provided by her wise yet indulgent parents, Florence Nightingale grew from an engaging child into the "girl of sixteen of great promise" that a contemporary letter describes.

## II. GIRLHOOD AND EARLY WOMANHOOD.

(1835-1853. PLATES III, IV, V, VI.)

In 1837, when his younger daughter was seventeen, Mr. Nightingale took his family to the Continent, and eighteen delightful months were spent in leisurely travel through France, Italy and Switzerland. Everywhere the best social, artistic, musical, literary and political circles were open to them, and they entered heartily into the complex foreign life about them. The tour ended with a winter in Paris, where, in the brilliant salons of their friends, the two charming girls discovered themselves both attractive and attracted. Freed from the shyness that had troubled her, Florence found she had social gifts of a high order, and confesses in her diary that the last temptation she had to overcome, before she was free to interpret that insistent inner call, was a "desire to shine in society."



PLATE III. FLORENCE NIGHTINGALE AS A CHILD.

From a drawing by Sir Hilary Burton. Letter in Sir Edward Cook's *Life of Florence Nightingale*.

All this was pleasant enough, and there was no reason to suppose at this time that Florence Nightingale would do otherwise than fulfil the expectations of her parents, and be content to live out the life of a happy English girl, and later, perhaps, become the wife of some good and worthy man. It was only after their return to England, and a short London season, when they were settled again in the midst of the busy hospitality of their country home, that a sense of the inadequacy of the social pleasures and domestic joys that surrounded her came upon her. It was to increase with the years, until, long before she attained her freedom, she struggled against the restrictions that bound her, with all the restlessness of a caged bird. The very happiness of the home that sheltered her, and the warmth of its affections, were gilded bars against which she almost broke her heart. To understand the nature and the greatness of this part of Miss Nightingale's achievement, that consisted in surmounting the obstacles that lay in the way of her preparation, one must project oneself in imagination into the age in which she lived, seventy years ago, when it was an unheard-of thing for a beautiful and accomplished girl to do anything outside of the precincts of her home. Her mother and sister, affectionate as they were, did not even understand her impulse, and when at last it formulated itself into a distinct sense of a vocation to care for the sick, as it did when she was twenty-five, they felt towards it a real disfavor. Nor can one blame them, remembering the low standards of hospital life of those days and the degraded type of nurse. She was an affectionate and dutiful daughter, and yielded to her parents' wishes for many years, doing her best to be happy and to make others happy, in what was to her a ceaseless round of trivialities, and often suffering intensely from the sense of frustration of her higher self. For, in addition to the fact that there were great powers of organization and execution fermenting in her mind, which at that time had no outlet, and that she was swayed by a really passionate altruism, Florence Nightingale was distinctly conscious, as much so as any other saint in history, of a "call to be a saviour," as she expresses it more than once in her diaries. In an autobiographical fragment, written in 1867, she mentions February 7th, 1847, at Embury, as the day when "God called me to His service," and several times this period is referred to as one of the chief crises of her inner life. It was the sense of defect in this inner call during these years, and the manner in which she suffered from it. Her father was a Unitarian, but she and her mother and sister followed the usages of the Church of England. Later in life, when she had been married, she was very broad, and her religious views were formed by the influence of her husband's personal faith, and the influence of the



her life this deeply religious attitude of mind, and this fact must be recognized in any true estimate of her life and work. In no other way is to be explained her humility of spirit, which may be likened to that of St. Francis of Assisi,



PLATE IV. MISS NIGHTINGALE (ABOUT 1845).

From an engraving in the possession of Miss Livingstone, Lady Superintendent of the Montreal General Hospital, Montreal, from a drawing by H. M. B. C., published Nov. 28th, 1854, by P. and D. Colnaghi, London.

and her dislike of public acknowledgment, which sprang not only from natural modesty, but from an inner principle.

It was with an affectionate hope of distracting her from her tiresome purpose, and with an entire lack of sympathy in her feeling, that her mother and sister planned and arranged several continental trips for her with congenial friends. The winter of 1847 was spent in Rome, with her friends the Bracebridges, who afterwards served with her in the Crimea. It was an eventful year for the future of her desire in more than one respect. In Rome she met the Sydney Herberts, and began that friendship with Lord Herbert, that was so fruitful in great results in the Crimea and after. And she became intimate with and studied the methods of an Italian nursing sisterhood. Moreover, it was a time of great happiness in other ways, for her appreciation of the beautiful was intense. The Sistine Chapel came to her as a revelation, and remained as one until the end of her life. Her description of it is exquisite.

The winter of 1849-1850 she again spent travelling, this time in Egypt and Greece. It was at Athens that she picked up a baby owl that had fallen among the ruins of the Parthenon. She carried it in her pocket, and brought it home to Embley, where it lived for years. A small tragedy of her departure for the Crimea, was that the family, in leaving town to see her off, forgot to feed the owl, which was dead on their return. The portrait of Lady Verney (Plate V) shows the owl on the pedestal beside her, and it is carved, too, on the foot of the Derby memorial statue.

It was on her way back to England from Greece, on July 31, 1850, that she first visited the Deaconesses Institute at Kaiserwerth on the Rhine. This had been the goal of her desires for the last six years, and repeatedly her hopes to see it had met with disappointment. It was a Protestant Sisterhood, organized by Pastor Fliedner and his wife, for the care of the sick poor, and discharged prisoners, and for the education of orphans, along lines which ap-



PLATE V. MISS NIGHTINGALE (ABOUT 1849).

From an engraving in the possession of the Victorian Order of Nurses, Montreal, from a drawing by her sister, Lady Verney, published June, 1855, by Colnaghi.

pealed intensely to her. The deaconesses took no vows, but came voluntarily, because they felt a vocation. She spent a fortnight in the institution then, and returned the following summer (1851), the free consent of her parents having



at last been obtained, for three months' training. In the hard work, long hours, and ascetic simplicity of the life, as well as in the high-minded admonitions of the pastor, she took the deepest delight, and pronounced herself at last "intensely happy." It was a turning-point in her career, for she came to feel there that her life was at last her own, and the time for indecision and yielding was past. There were still difficulties and doubts at home, but she was no longer restless, but assured. February of 1853 saw her established at the *Sœurs de la Providence* in Paris for another short period of study, and in July of that year she took her first

attained only through difficult stumbling. "Let those," says Sir Edward Cook, "who reproach themselves for a desultoriness, seemingly incurable, take heart again from the example of Florence Nightingale! No self-reproach recurs more often in her private outpourings at this time, than that of irregularity and even sloth. She found it difficult to rise early in the morning; she prayed and wrestled to be delivered from desultory thoughts, from idle dreaming, from scrappiness in unselfish work. She wrestled, and she won." To her again the palm of victory!

Again, the unfulfilled longing that so long possessed her for practical expression of her powers and mission, and her habits of self-examination and of religious thought, did not prevent her from sharing in a very full way the life that went on about her. Florence Nightingale was no sad-eyed ascetic. We hear of her managing private theatricals, mothering young cousins, nursing maiden aunts, absorbed in housekeeping responsibilities, sympathizing with the love affairs of friends, and a host of other things. No happiness could exceed that of that winter in Rome.

Nor did she escape that experience that comes to almost every man and woman in life. She was sought in marriage, long and persistently, by one with whom her own heart was engaged. With a clear-sightedness, born of her consecration to an ideal stronger and higher than for self, she put this form of earthly happiness behind her, feeling that she could not do her duty to him and to her work. Not from any belittlement of the married state, nor from any lack of knowledge of what the higher kind of marriage might mean to them both did she act, but in the same spirit that prompted Saint Theresa or Santa Filomena. One of the most touching of her good-bye letters before she left for the Crimea was from this friend. "You undertake this," he wrote, "when you cannot undertake me!"

(T. B. C.)



PLATE VI. FLORENCE NIGHTINGALE

From a painting in the National Portrait Gallery, by Augustus Egg, R. A., and reproduced in the Life of Florence Nightingale by Annie Matheson.

post, as superintendent of the "Sick Governesses Home" on Harley Street. Here she remained, winning the confidence of a difficult committee, and a still more difficult class of patients, until a short time after the outbreak of the Crimean War.

In this little sketch of Florence Nightingale, during her time of aspiration and probation, there are many aspects that have not been touched upon at all. Her character was indeed fair and pure, as these early portraits well show, but there were shadows as well as lights within it. The requirement, for instance, of the remarkable habits of precision, regularity and method that characterized her later years was

## Original Articles.

### THE PRESENT STATUS OF ALVEOLAR OSTEO-MYELITIS (PYORRHEA ALVEOLARIS). ITS CAUSES AND TREATMENT WITH VACCINES.\*

By LEON S. MIDLAR, M.D., BOSTON.

#### INTRODUCTION.

It is now almost ten years since I first began the use of vaccines in various diseases due to bacterial infections, among which was the

\*Read before the Boston Society for the Study of Bacteriology, April 15, 1914.



ease known as "pyorrhea alveolaris," but which is in reality an alveolar osteomyelitis. The vaccine treatment of this disease had found such favor among the dental profession to the extent that I was able to report 115 cases in 1912 before the National Dental Association in Washington. Anyone interested will find in that article, published in the *BOSTON MEDICAL AND SURGICAL JOURNAL* (Dec. 19 and 26, 1912), a detailed description of the cases treated, with a complete account of the bacteriological findings, urine and feces examinations, as well as of the local and systemic conditions found in each patient. I have had under observation since then 82 additional cases which will be reported in detail later.

What I wish to take up in this paper, however, more especially, is the present status of this disease, paying special attention to the new claims made by various workers in this field as to its causation and treatment. I shall take great pains to separate the wheat from the chaff, and discuss, in as concise a way as possible, my impressions of the latest developments in this most intractable and important of mouth infections.

#### ETIOLOGY.

The thorough understanding of the anatomical relations between the alveolar process, socket and root of the tooth is absolutely necessary before any one can have a proper conception of the cause of this disease, of its prognosis and of its treatment. In the paper<sup>1</sup> presented before the National Dental Society already referred to, I have called attention to the true anatomical relation between these structures. I have emphasized again the importance of this same thing in another paper read before the Merrimack Valley Dental Association.<sup>2</sup> It seems, however, from recent literature on the subject, that this fundamental knowledge of the anatomical and physiological relations of the alveolar process, socket and root of the tooth has not as yet percolated to those who seem to be interested in this subject. They still cling to the erroneous impression that there is a periodontal membrane which acts as a sort of cushion to the tooth. They also refer to this as a "periosteum which is continuous with that of the surface of the jaw bone, but it also continues up and covers the neck of the tooth." "Pyorrhea dentalis and alveolaris," they say, "affects primarily the dental and alveolar periosteum."<sup>3</sup> The fact is that there is no such thing as a "dental periosteum."

I feel that if it were not for this misunderstanding of the anatomical and physiological relations of these parts, the dental and medical literature would have been saved a great deal of wild and baseless statements in relation to the etiology and treatment of this disease. I feel it incumbent again to emphasize the true anatomical relation which the tissues surrounding

the root of the tooth bear to its socket, and what the alveolar process really is.

The alveolar process is nothing more than the thinned-out edges of the maxillary bones and their trabeculae or bony offshoots, as has been well demonstrated by Malassez,<sup>4</sup> and is not a bone distinct from the maxilla, but is *part of* the maxilla. The socket is nothing more than an enlarged medullary space of the maxilla, and is made up of the above-described bony offshoots which constitute the alveolar process, while instead of the so-called "periodontal membrane" or the "dental and alveolar periosteum,"<sup>73</sup> we really have an alveolo-dental ligament,—bundles of *ligament* fibers which run from the wall of the bony offshoots of the alveolar process and maxillary bone and are imbedded deeply into the cementum of the root, forming a circular ligament which keeps the tooth suspended in the alveolar cavity. Between these bundles of ligament fibers there are spaces filled with loose cellular tissue—medullary spaces—which communicate with other similar medullary spaces of the maxilla and alveolar process. These spaces contain the voluminous blood vessels and nerves of that region. (In a recent book on Dental Pathology, by Black,<sup>5</sup> as well as that by Kirk,<sup>6</sup> we find some mention made of fibers as being present in the periodontal membrane. But they do not refer to them as *ligament* fibers. The mere description of the finding of fibers histologically does not convey any special meaning as to what these fibers really are, and one could never learn from those descriptions that they refer to *ligament fibers*, and that the tooth is held by a circular ligament attached to the maxillary bone.)

The nature of the disease under discussion, as has been well demonstrated by Znamensky,<sup>7</sup> is a downward process. It begins with an inflammatory process of the gum margin, soon involves the medullary spaces of the alveolo-dental ligament and the alveolar process—the bony offshoots themselves—which becomes necrotic and is in time dissolved away. The disease finally involves the marrow spaces of the maxillary bone itself. We can, therefore, only refer to this disease under the circumstances as an osteomyelitis of the alveolar process and maxillary bone. It being a chronic condition, as a rule, we have, I believe, no choice but to consider it as a *chronic alveolar osteomyelitis*.

So-called "pockets without pus," referred to by dentists as "dry pyorrhea," I have always found to contain pus and bacteria, and occasionally endameba on microscopic examination, showing a definite infection with a suppurating process, which has begun on the surface and has worked downward, and not vice versa, as one would infer, if the disease were due to endameba.

Having described the true nature of the anatomical relation of the alveolar process, socket and root of the tooth, without which I feel no



dentist could see light upon the subject, we can now pay attention to the specific causes, if any such there be, of this disease.

#### ENDAMEBA BUCCALIS.

Owing to the prominence given in the medical and dental literature to the claims made by Bass and Johns<sup>8</sup> for this harmless unicellular organism—the endameba buccalis—as being the “specific” cause for pyorrhea, we shall have to look into these claims to try, if we can, to establish how much truth, if any, there is in them.

As far as I can see, the principal underlying reasons given by Bass and Johns<sup>8</sup> for these claims are: (1) the fact that the endameba is present in greatest numbers in the deeper parts of the pockets and to a lesser degree in the upper parts of the pockets; (2) the erroneous claim made by them that this organism is not found in healthy gums; and (3) the fact that emetin, a well-known amebicide, when administered to patients suffering with this disease, was followed by an improvement in the condition, and caused these amebae to disappear.

As to the first contention, the fact that it is found in the deeper parts of the pockets is referred to by them as chief evidence for its being the “specific” cause and they say, “What more evidence of pathogenicity do we need?” As if the mere finding of any harmless organism, demonstrated by various observers to be harmless, would be sufficient to establish the claim for such organism as being the “specific” cause of a disease. They pay no attention whatsoever to the presence of bacteria, known to be pathogenic, present in great abundance in these deeper parts of the pockets, and upon which these endamebae really feed and are rather of help to the patient, as has been stated by Chiavaro.<sup>9</sup>

Their second claim, that endamebae are not found in the gums of healthy individuals, has been refuted by Lewald,<sup>10</sup> who described this endameba over seven years previous to Barrett and Smith's<sup>8</sup> and Bass and Johns' description of this organism. Lewald was able to convince himself from his studies “that these amebae could be demonstrated in the month almost constantly, no matter how much care was taken of the teeth.” He “examined persons coming from all parts of the country and abroad, and the constancy with which the organisms had been found left no doubt in his mind as to its presence in the human mouth in health, equalling in this respect the presence of the *B. Coli* in the intestines.”

A very careful piece of work on the subject was reported by Angelo Chiavaro,<sup>9</sup> who concluded from his researches that the endameba “is generally present in *materia alba* of the sound teeth if they are not kept in a good hygienic condition.” And finally that the “endameba has not a pathogenic action. On the contrary, as it feeds on bacteria, it is most probably an aid to the auto-disinfection of the mouth.”

Anna Williams and her co-workers<sup>11</sup> of the Research Laboratories of the New York Board of Health have found this endameba in 30% of children with healthy gums, in 50% of children with healthy gums and carious teeth, in 84% of children showing tartar around teeth and receding gums, and in 94% of children with spongy gums.

Finally, Price and LaRue<sup>12</sup> in their summary on this subject, prepared for the Scientific Foundation and Research Commission of the National Dental Association, stated that they have been unable to find the endameba in severe pyorrhea cases, and that in many cases the use of emetin has given poor or no results. They state that the proof is as yet insufficient that the endameba has anything whatever to do with the production of pyorrhea.

I have personally examined several cases of alveolar osteomyelitis (pyorrhea) with results similar to those of Price and LaRue. In some of the most severe cases, with considerable pus, I could not demonstrate this organism after a prolonged search of several stained slides; while on the other hand, they were quite fairly abundant in patients who have taken several bottles (6 bottles in one case) of alcresta pills (40 tablets, I believe, to the bottle), without showing any improvement in the condition, and who have, therefore, applied for vaccine treatment.

I cannot help but sum up that the evidence is very much against the Endameba Gingivalis (*Buccalis*) having any causal relation, and especially a “specific” etiologic relation to alveolar osteomyelitis or “pyorrhea.”

Their other claim, that the use of emetin has been found by them to cause the disappearance of the ameba in the pockets and an improvement of the condition locally,—as being another indication that the ameba is the cause of this disease,—can be refuted by the fact that whatever improvement was noticed in this disease from its use could be easily ascribed to the hemostatic action of the emetin and its antiseptic (bactericidal) effect. Numerous cases, however, are appearing today where there has been neither disappearance of the endameba by the use of the emetin nor the improvement of the disease, so this last fundamental claim for the endameba as the “specific cause” of alveolar osteomyelitis falls to the ground.

In fact, we find in small type under the heading “Note,” in the book by Bass and Johns,<sup>8</sup> this statement: “Since our early publications we have seen a considerable number of cases in which endamebae have reappeared after they had been absent for various periods of time following the use of emetin in one way or another. . . . We have also seen . . . they saw a considerable number of cases in which the endamebae have not been eradicated even after short time, by emetin.”

This admission, though in very fine type, of



the failure of emetin to have even an effect upon the endamebae, without mentioning the failures in improving the condition by this treatment,—all of which has been admitted by the very men who claim for the endameba the "specific cause" in connection with this disease,—is in itself sufficient to refute their own claim.

Personally, I feel that owing to the anatomical relations of the tissues surrounding the root of the tooth and the disease in question being really pathologically an osteomyelitis, no one organism can possibly be found to be the specific and only cause of this disease, any more than it can be said that any particular one bacterium or protozoön can be the only specific cause of an osteomyelitis affecting any other bone of the body. The more I have to deal with this affection, the more am I convinced of the truthfulness of my statement made before the National Dental Association in 1912,<sup>1</sup> to the effect that "chronic alveolar osteomyelitis is not due to a specific microorganism present in all cases, in the same way as tuberculosis is always caused by the tubercle bacillus, but is due, according to my own findings, and those of other investigators, to a mixed infection of different bacteria, the most prevalent being the strepto-pneumococcus variety."

#### BACTERIA IN ALVEOLAR OSTEOMYELITIS.

I have already described in detail, in the paper presented before the National Dental Society in 1912, the relation of bacteria to this disease. The large number of investigators on the subject, beginning with Galippe<sup>14</sup> as far back as 1888, Miller<sup>15</sup> in 1890, Kirk,<sup>16</sup> Black,<sup>17</sup> Von Arkövy,<sup>18</sup> Goadby,<sup>19</sup> Ayre and Paine,<sup>20</sup> and the host of other investigators have described one or more forms of bacteria of the suppurating types in connection with this disease, the predominating one being that of the strepto-pneumococcus variety.

In the 112 cases I have already reported where cultures were obtained, 107 had this strepto-pneumococcus type of organism, either alone or in conjunction with one or more other bacteria. In the 82 additional cases I have had to date the bacteriological findings were practically the same as those described. A number of observers prefer to call this organism streptococcus viridans. I have considered it pneumococcus in chains, or strepto-pneumococcus. These bacteria are known to be pus-producing bacteria and, when inoculated into animals, produce disease and suppurative changes. I have personally been able to produce (as already reported<sup>1</sup>) inflammatory changes in the gums of dogs with the bacteria isolated from "pyorrheal" pus, changes sufficient to prove the pathogenicity of these organisms and their relation to alveolar osteomyelitis.

The relation of these bacteria to alveolar osteomyelitis is further demonstrated by the fact

that patients suffering with this disease have yielded to the autogenous vaccines made from these organisms and administered to them. The response to the vaccines being specific, the vaccines could, therefore, have no other effect upon the disease unless it be to immunize the patients against the infectious agents (bacteria), to which we attribute the cause of this disease, and from which the autogenous vaccines are made.

Probably as important a fact in favor of the bacterial cause of this disease is the systemic diseases secondary to this local alveolar osteomyelitis.

A great deal of work has been done on the systemic secondary infections, important among which is that of Rosenow,<sup>21</sup> who demonstrated the strepto-pneumococcus type of organisms in the joints and muscles of patients suffering with rheumatism, apparently secondary to the alveolar infections. I believe that the mode of spread of infection from the oral cavity is principally by way of the blood,—the bacteria invading the blood either directly from the local focus of infection or from the stomach and intestinal tract, as has been found at the Pasteur Institute.<sup>22</sup> Antitoxin, if obtained from a horse after a meal, was found at the Pasteur Institute to develop microbes, no matter how carefully it was obtained. The horse, therefore, is bled after he is kept fasting, in order to obtain a sterile serum (antitoxin). Such microbe invasion of the blood from the intestinal tract is always to be kept in mind. The only protection against it, it seems to me, in the disease under discussion, next to eradication of the local foci, which may not always be possible, would be by raising the blood resistance by means of autogenous vaccines to such organisms as might be swallowed with the "pyorrheal" pus.

Since it is unanimously admitted that the secondary infections—secondary to the local mouth infections—are of bacterial origin, I can see no rationality in the paradoxical claim made that the original local foci of infection are not of the same bacterial origin. (So much for the bacterial cause of the disease.)

It may be worth while to say a few words in connection with Talbot's theories as to the causation of alveolar "pockets." Talbot<sup>23</sup> describes them in answer to the question that he asks himself, "What are pockets?" thus: "They are spaces," he says, "between the gum and the root of the tooth, due to irregular absorption of the alveolar process." "Halisteresis [lime absorption] or perforating canal absorption," he says, "is the most common in the disappearance of the alveolar process. . . . This, together with the destruction of the periodontal membrane in this area, is what would be called a pocket."

Talbot has apparently described the findings of the condition as they appear microscopically, but he has given no cause for the production of



such pockets. He is, besides, very much put out by the suggestion of the "germ theory" as having anything to do with the causation of disease in general and the production of alveolar osteomyelitis (pyorrhea) in particular.

He also says, "A pus infection is always a secondary matter, since the pockets are there, whether the pus is present or not." As a matter of fact, by obtaining material from such so-called dry pockets with a platinum loop or with a fine probe, I have personally always found on microscopic examination of such material considerable pus and bacteria present. Talbot, as well as a great many others in the dental profession, overlooks the possibility on the part of bacteria to produce toxic substances capable of causing the death of the tissue cells, which dead tissue nature will try to get rid of by gradually dissolving it, whether it be soft tissue or bone, thus causing a pocket in the alveolar process similar to the sinus or fistulous infection in any other tissue or bone.

Bacteria of whatever type, then, capable of implanting themselves and causing infection, will elaborate toxins, which in turn give rise to death of tissue cells. The dead tissue gradually dissolves away and discharges, forming a "pocket." The ability on the part of the bacteria to cause infection will depend upon the high virulence of the bacteria, also upon the general lowered resistance of the individual or upon the lowered resistance of the tissues locally, due to local irritation produced by tartar deposits, mal-occlusion, ill-fitting crowns, and a number of other local irritants.

I have discussed and touched upon the etiology of this disease, bringing the subject, I believe, up to date. We shall now take up the treatment of this condition, and I shall try again to call attention to the important points in the treatment which have a definite bearing upon the etiology of this disease.

#### TREATMENT.

**Instrumentation.** I shall not go into the details as to the use of instrumentation in this disease, since I have always depended upon the dentist for this phase of the treatment. The principles of instrumentation, however, as far as I can see, which should be kept in mind by every one, are: the removal of local irritation, such as tartar deposits and calculi when present; avoiding ill-fitting crowns and injurious plates; doing away with mal-occlusion; removing all teeth that cause crowding of other teeth; keeping pockets open so they can readily drain; and, with the aid of the X-ray, to determine which of the teeth have lost all their bony support, which teeth should be removed.

It is interesting in this connection to cite Merritt's<sup>24</sup> view "that pyorrhea can be prevented in 90 to 100%" and that it "can be cured by instrumentation, provided only that it is done skilfully." While Talbot<sup>25</sup> says: "In

the treatment of pus pockets, the less instrumentation used to remove the deposits upon the roots of the teeth, the better. All that is necessary is to give nature a chance."

Here are the views of two extremists on instrumentation. One thinks he can cure by instrumentation alone practically all cases of alveolar osteomyelitis, throwing down everything else suggested in connection with the treatment of this disease; while the other would not even have you properly remove the deposits on the roots of the teeth. The truth of the matter is that some dentists go much too far with instrumentation, while others do far too little. The happy medium is what is required.

The proper knowledge of the anatomical relation of the root of the tooth to its surrounding tissues, the thorough understanding of the principles underlying instrumentation, together with the proper conception of its limitations, will all help one strike the happy medium in this phase of the treatment.

#### EMETIN TREATMENT.

I can say at this present time for emetin treatment that the consensus of opinion is that whatever improvement has been noticed from its use is not so much due to its effect upon the endameba, but rather to its hemostatic action, as well as its bactericidal properties. It is surely not a curative agent because of the nature of chemical drugs in general and their effect upon chronic diseases. No sooner do you stop their use than they immediately are eliminated by the system, allowing the infectious agents, of whatever kind there may be, at once to start the process up again. As already quoted from the book by Bass and Johns, the original advocates of this treatment, they have found a considerable number of cases in which the endamebae have reappeared after they had been absent for various periods of time following the use of emetin, in various ways, and again a considerable number of cases where the endamebae have not been eradicated for even a short time by emetin. They have, therefore, been advising recently the continuous use of this drug in patients suffering with this disease. Reports are coming in thick and fast now, both in the medical and in the dental literature, of the failure of emetin in this disease from men who have used emetin in a large number of cases, and have found it of very little help. Even in the most optimistic report on the use of emetin, presented by Rudolph C. Lineau,<sup>26</sup> where he claims that the inflammatory condition in the mouth subsided after the injection of emetin, he, too, believes that the improvement was due to the hemostatic action of the emetin, and not to its specific effect upon the endamebae.

A very good article on the endamebae of the mouth was published by Charles F. Craig, who had treated several "pyorrhea" cases with emetin "in the most approved way for several



weeks." He has found: whereas the endamebae generally decreased in number by its administration, they certainly were not eradicated, and that a similar decrease in number was true of the spirochetes. There is just as much ground to consider the spirochetes as the cause of the disease because of their presence before, and the decrease after the administration of this drug, according to him, as there is to consider the endameba to be the "specific" cause of pyorrhea.

It is rather surprising to read in an article in this connection, by Kolmer and Smith,<sup>27</sup> that they have studied the bactericidal action of emetin in vivo on staphylococcus aureus, bacillus tetani and bacillus anthracis, all of which organisms are not at all related to the disease in question (with the rare exception of the staphylococcus aureus, perhaps). Their findings have, in my opinion, no bearing upon the controversy and will help very little to establish the effect of the emetin upon the bacteria found in the pockets of this disease. They certainly have no ground under the circumstances to say in conclusion: "Improvement or cure of this disease with subcutaneous injections of emetin is to be attributed solely to its amebicidal action," though they concede some coincidental bactericidal influences on the part of the drug when used locally in the pockets.

I do not mean to minimize the amebicidal action of emetin. This has nothing to do with its bactericidal effect and hemostatic action, which alone are sufficient to account for whatever slight improvement in the gum is noticed in this condition under its use. Personally, I have had no occasion to use emetin, since the autogenous vaccines have given me the desired results. However, cases have come to me applying for vaccine treatment upon whom the emetin treatment had already been tried and had failed, and I have had, as it happened, five such cases in one week recently. I found in these cases where, possibly, according to the statement of the patient, there has been slight diminution in the *visible* pus, some improvement in the inflammatory condition and bleeding, yet the loose teeth were still loose, as before, and the pockets still contained pus, bacteria, and, in some, quite a few endamebae, as shown upon microscopic examination of slides made from such pockets. Their applying for vaccine treatment is sufficient evidence of the failure of emetin in this disease.

#### MERCURY SUCCEINAMIDE.

Mercury succinamide is another drug for which considerable claim has been made by B. L. Wright,<sup>28</sup> in the cure of this disease. Wright has gone so far as to claim 100% of "cures" with it. The extravagance of such claim in itself is almost sufficient to make one pay little attention to it.

The cases treated by Wright and his co-work-

ers, as far as I can make out, were mostly men who had probably paid little attention to the proper hygiene of their teeth and gums; if such men receive a thorough cleansing by a dentist, tartar deposits being removed, and the cause of inflammatory irritation done away with, their gums respond in the most miraculous way, as we all know. And in what would seem to some a hopeless case of alveolar osteomyelitis, no other treatment but a good cleansing by a dentist and attention to the general hygiene of the mouth, as described, would cause the gums to show such striking improvement in a short time as to make the unwary believe that he has had 100% of "cures."

It is totally different in cases of private practice among the better class of patients, where the teeth have always been attended to by dentists, and the mouth and gums kept in the most hygienic way by the patient. In such cases, when we get this disease, the mere inoculation of mercury, I do not believe, will have more than a passing effect, if any at all, and the use of antiseptics or antiparasitics alone will, I believe, be found very much of a disappointment.

Nothing would have pleased me more than to find that such simple means as the injection of emetin or the taking of aleresta tablets by mouth, or even the less simple and more painful remedy of the deep intramuscular inoculation of mercury, would yield the proper results in this important mouth infection, since the experience I had with this disease, and because the way in which I found results, has been a much longer road and a much more difficult one to travel,—one that requires painstaking attention to details and bacteriological methods of the highest order.

#### VACCINE TREATMENT.

This treatment has been such that it has proven in my hands to give more satisfactory results in this disease than any other treatment as yet suggested. It has withstood the hardest test—time. The good results I have obtained with it have not been a question of a few weeks or a few months' experience, but it has been a matter of over nine years' work.

*Method of Procedure.* In my own practice, cases with alveolar osteomyelitis, who apply for treatment, are given a thorough physical examination. The history is carefully taken, and particular attention paid to any special cause or causes that have been noticed by the patient to have given rise to a sudden exacerbation of the gum trouble at any time. A careful urine analysis is made, examination of feces, both chemical and bacteriological, is done. Blood is examined microscopically. Wassermann test for syphilis is done in all cases that are at all suspected of the disease. Cultures from the gums, pockets, nose and throat are obtained, and a thorough bacteriological examination made. Autogenous vaccines are prepared from such



sources that appear at all suspicious of causing infection. (For technic of cultures see note.\*) The details of the laboratory findings, both chemical and bacteriological, can be found by anyone interested, in my paper already mentioned.<sup>1</sup>

The following table (Table A) is the summary of the bacteriological findings in the 115 cases reported.

TABLE A.

Pneumo.† (strepto. lanceolatus pneumoniae) 26 times.	26	"
Pneumo. and staphylo.....	67	"
Pneumo. and strepto.....	3	"
Pneumo., staphylo. and strepto.....	10	"
Pneumo. and M. catarrhalis.....	1	"
Staphylo. and M. catarrhalis.....	2	"
Staphylo. aureus.....	2	"
Strepto. and staphylo.....	1	"
Sterile .....	3	"

The chemical examination of the fees reveals the presence of an excessive amount of undigested meat or starch, and by means of Schmidt's fermentation test it is possible to detect whether the particular intestinal fermentation, of which the patients complain, is that of the carbohydrate fermentation or meat putrefaction. This chemical examination was found of the utmost value in deciding upon the proper diet for the individual case. The urine analysis would, of course, give a clue as to whether the patient is suffering from any kidney disease or diabetes.

The discovery of such disturbances of systemic conditions is, I believe, of the utmost importance for the successful treatment of the disease in question.

**Vaccine Treatment.** This treatment is in reality an artificial active immunization of the individual against such bacteria as are used in the form of vaccines; so that when we obtain bacteria from the alveolar pockets that are causing the infection, and make an *autogenous* vaccine in each individual case, the patient receiving such autogenous vaccine is in reality being immunized against the particular bacteria which are causing the infections of the gum and the alveolar process. This is the only direct way, we know of, to raise the resistance of the individual against such bacterial infection. The vaccine is not a serum or a lymph obtained from an animal, and it is not in any way an

\* **Technic:** Cultures from the gums were obtained in the following manner. The lips or buccal parts were kept away from the affected tooth by means of a sterile tongue-depressor by the patient or assistant. The gums around the affected tooth were carefully wiped off with sterile cotton. The pus was then squeezed out by means of a sterile swab. This pus in turn was collected with a fresh swab and labeled No. 1. Further pressure would cause a second and third drop to ooze out which were collected on a second and third swab respectively. The first drop of pus was smeared upon cover slips for the direct microscopic examination while the second and third drops of pus were used for cultural purposes. In cases where there was no visible pus present (timpant and some moderately-advanced cases) the gums showing the most sluggish inflammation or recession were used. A sterile heavy platinum wire was used to obtain material for cultural purposes, alongside of swabs, from the "pocket," if any were present. Several culture tubes were inoculated at the same time and results compared. All efforts were made in each individual case to obtain cultures from the pus or affected places, as free from contaminating material or contaminating organisms as is possible under the strict bacteriological methods.

† Pneumo., in the above table, refers to the streptopneumococcus type of organism.

animal product. It is in reality a suspension of killed bacteria, suspended in sterile salt solution containing a quarter of one per cent. of phenol.

**Autogenous versus Stock Vaccines.** The autogenous vaccine is, of course, a suspension of the killed bacteria obtained from the individual patient who is to be treated, while the "stock" vaccine is a mixture of organisms obtained from others than the individual patient, so that in treating patients with "stock" vaccines, the production of antibodies being specific, the results would, of course, be indifferent, since the bacteria of which "stock" vaccines are made up, although they may resemble microscopically and culturally those obtained from the individual patient, still may have, and usually do have, different individual biologic characteristics. Practically all the cases I have personally had under observation have been treated with autogenous vaccines, at times in combination with the corresponding stock vaccines; the latter, in order to raise the resistance of the patient to infections which he might pick up, even after his resistance to his own individual bacteria has been raised.

**Administration of Vaccine.** The vaccine is administered in the upper arm, and if a fine needle is used (gauge 26) there is very little feeling of pain attached to the inoculation. If the proper amount of vaccine is used, there is very little after-effect from it. The most that can happen is slight redness and slight soreness around the focus of injection, lasting for 12 to 24 hours. No general reaction ever occurs if the proper dose is given.

The actual results obtained in the 115 cases I have reported in 1912, treated with vaccines, are shown in Table B.

TABLE B.

Stage.	No. of Cases.		Periods.		Results.	
	Cured.	Improved.	No Improvement.	Cured.	Improved.	No Improvement.
Inipient ....	13	1	—	92	2	—
Mod. advanced 15	1	—	—	93	—	—
Far advanced 37	40	4	43	47	5	—

The results in the 82 cases I have had since have practically been the same, though I have had no opportunity as yet to tabulate them.

## GENERAL SUMMARY.

In summarizing briefly the subject under discussion, I would say that the alveolar process, so called, surrounding the root of the tooth, is simply the thinned out edges of the maxillary bone, while the socket is nothing more than an enlarged medullary space of the maxilla. The "peridental membrane" so called, is really made up of bundles of *Epithema fibrovascularis* from the bony processes of the maxilla and



inserted into the root of the tooth. They are arranged in a circular form, making a circular ligament, but it is a *ligament*, and not a "membrane" nor a "periosteum." (Any one could satisfy himself to that effect when he thinks how the acrobat can develop the strength of his teeth so that he can hold an anvil with them, with somebody hammering on it.) In between these bundles of ligament fibers we have spaces which connect with the medullary spaces of the maxillary bones, and are filled with loose medullary cells, that hold the nerves and blood vessels of the part.

The disease begins with a local irritation at the gum margin, causing a lowering of the resistance of the tissues locally, thus allowing the bacteria to implant themselves, reproduce and cause infection. If the irritation is not at once removed, it is obvious that such infection, though mild in the beginning, would spread farther down towards the bone itself, causing congestion and sponginess of the gum, and finally attacking and dissolving the alveolar process itself, forming fistulous sinuses or pockets, and if allowed to go on it finally destroys the whole of the bony socket and the tooth is loosened up. So much for the progress of the disease and its formation.

Now, with reference to the endamebae and their relation to alveolar osteomyelitis, there seems to be very little evidence at the present time for the recent claims made, that the endameba buccalis is the "specific" cause of this disease. Even if it had any pathogenic properties, which is very much doubted by very good authorities on this subject, there is no real ground to attribute to it the "specific" cause of this disease.

Whatever improvement has been noticed by the use of emetin in this disease could easily be explained by the increased attention given the patient by the dentist, by the hemostatic effect and the bactericidal or antiseptic action of the emetin. In those cases where the pockets have been actually washed out with the emetin solution, the improvement, I believe, is due under those circumstances to the local washing out of the pockets by improving their drainage, and to whatever antiseptic value the emetin has, if not wholly to that, rather than to its amebicidal action; so that in the ameba we have neither the specific cause of the disease, nor in the emetin its "cure."

As to the deep injections of mercury in this disease, I feel that where improvement did follow its administration, it was due to the fact that some of the patients were probably primarily suffering from syphilis, while the vast majority of the cases treated by the men who claim that they can obtain 100% of "cures" with it, has been probably in patients with very neglected mouths, where the gums have been aching for attention rather than for mercury. The pain produced by the deep intramuscular in-

jections of mercury should always be kept in mind, even when treating syphilitic patients, and for that reason the internal use of the various iodids of mercury, or mercury with chalk alongside of the salvarsan treatment, is to be preferred. Finally, the deep intramuscular injection of mercury will, I believe, be found of no more value in the treatment of this disease than its use in pulmonary tuberculosis, for which as much has been claimed by the same advocate of the mercury treatment. In the latter disease, as far as I know, mercury succinamide has been faithfully tried, and failed, in the hands of various men throughout the country.

*Relation of Bacteria to This Disease.* The bacterial relation in this disease has been demonstrated by means of the bacteriological findings of smears and cultures, by the secondary systemic infections and by the response of the disease to the autogenous vaccine, and, finally, by actual animal inoculation and the artificial production of inflammatory changes in the gums of dogs. Although the inflammatory changes produced in the gums of dogs used were not lasting (possibly due to the good general condition of the dogs I have used for the experiments, and the lack of local mechanical irritation), still it was sufficient to show that the organisms (strepto-pneumococcus) isolated from the alveolar disease do cause inflammatory changes if artificially inoculated into the gums of animals. It is true that there may be a difference of opinion as to the nomenclature of this organism, some calling it streptococcus viridans, others, pneumococcus or strepto-pneumococcus. The organism, however, remains the same by whatever name it is called. Personally, owing to its close relationship to the pneumococcus, I considered it strepto-pneumococcus. However, even with the bacterial relation of such organism to this disease being established, it is far from my mind to consider it as the "specific" primary cause of alveolar osteomyelitis. This disease really has local mechanical irritation, local bacteria, systemic general lowered resistance and systemic diseases as causes; and if one is to hope at all for any cure in this disease, one must attack them all.

I can do no better in concluding than to repeat the "conclusions" I have arrived at in 1912<sup>1</sup> on this subject, and any one who can read, and think while reading these conclusions, will find practically everything that can be said on the subject, in a few words.

#### "CONCLUSIONS."

1. "Pyorrhea alveolaris," so called, is in reality a *chronic alveolar osteomyelitis*. It should be known and treated as such.

2. The sockets are enlarged medullary spaces of the maxillary bones while the so-called "periodontal membrane" is in reality a *ligament* which keeps the tooth suspended in the alveolar cavity.



3. The mechanical causes are responsible for starting the disease, while the pyogenic bacteria (pneumococcus, staphylococcus, and *M. catarrhalis*) are responsible for keeping it up.

4. Chronic alveolar osteomyelitis is a specific disease, though not in the sense that it is always due to one and the same organism; it is due to a variety of organisms, already enumerated.

5. Systemic diseases play only a secondary part in starting the disease, but may be caused by it, and in turn become responsible for keeping up the local condition.

6. A great many rheumatic diseases, so called, also a great many gastro-intestinal affections are, in my opinion, directly related to chronic alveolar osteomyelitis—"Riggs' disease."

7. The vaccine treatment of this disease, together with the proper attention to diet, cures or relieves the systemic diseases, especially the rheumatic affections.

8. Vaccine treatment (immuno-therapy), together with local mechanical treatment (and the proper attention to the general systemic condition of the patient) yields by far the best results in this intractable disease—*chronic alveolar osteomyelitis*.

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## THE USE OF EMETIN.\*

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EMETIN can be estimated today as one of the major drugs, particularly in medical practice in hot climates. A better understanding of its activity, as well as of its limitations, together with recent extensions of its field of usefulness, makes it an important drug also for medical practice in temperate climates. The tremendous destructiveness and menace of amebic dysentery has been removed by its introduction, and it has been employed in pyorrhea with at least helpful results. It has also been used in certain non-amebic conditions, where its results are open for interpretation.

The literature on emetin is so extensive and there are so many conflicting opinions regarding it, that it is not feasible at this time to enter into a detailed discussion. It is the intention of this paper rather to present in more or less didactic form the salient features of the history, pharmacology, toxicology and use of emetin, all of which must necessarily be brief, and rather an outline than a connected thesis. It is hoped, too, that such an outline will arouse practical discussion of the points presented, especially in their clinical bearing.

## HISTORY.

According to an editorial writer in the *British Medical Journal* (Nov. 13, 1915), ipecac was introduced into Europe from Brazil, where it had been used for an indefinite period, in 1648, by G. Piso, who was a companion of the Duke of Nassau in his explorations in Brazil and the West Indies. No further notice, apparently, was taken of the drug until the exploitation of a secret remedy for dysentery by J. A. Helvetius, in Paris, in 1686. This physician successfully treated the Dauphin, the son of Louis XIV., and the preparation was then used at the Hotel Dieu, and finally the formula was bought by the French government and made public two years later. The treatment again lapsed into desuetude until early in the nineteenth century, when English physicians, especially in the army, took up the use of large doses of ipecac in dysentery. The matter was particularly forwarded by officers of the Indian Medical Service.

A mixture of ipecac alkaloids was isolated in 1817 by Paderlet and by E. Gueneau de Mussy, the name later being retained for a single alkaloid. Later on, Walsby and Porter, in 1860, obtained results in acute dysentery by the use of one grain daily of a mixture of 0.2 A. of emetin, and stated that the alkaloid was more effective and suggested the preparation of a tablet containing



for human amebiasis. Leonard Rogers in Calcutta thereupon administered emetin hypodermically in amebic dysentery and achieved remarkable results which have since been abundantly confirmed.

The history of emetin thus originates in the history of ipecac root. Then came the isolation of an alkaloidal mixture from the root and more recently the various ipecac alkaloids have been isolated and studied individually. However, not until within a comparatively few months has pure emetin been prepared. Practically all of the emetin used and even now available is impure and has been shown to have a dangerous variation in activity and toxicity. In spite of peculiar technical difficulties, refined methods of analysis have now produced a pure emetin which so far has not been thoroughly studied in either the clinic or the laboratory.

#### PHARMACOLOGY.

Hesse has devised a method of isolation which gives pure emetin. Just as Paul and Cowley in 1893 had shown that the earlier emetin was a mixture of emetin—as we now understand it—and cephaelin, so Hesse has again shown the emetin of ordinary use to contain an admixture of a cephaelin-like body. He considers that ipecac, both cultivated and wild, contains five alkaloids (Liebig's *Annalen der Chemie*, 1914, 405, 1), the most important of which are emetin and cephaelin.

Emetin  $C_{30}H_{40}N_2O_5$   
 Psychotrin— $C_{28}H_{36}N_2O_4 + 2H$  gives Cephaelin  $C_{28}H_{38}N_2O_4$   
 Ipecamin— $C_{28}H_{36}N_2O_4 + 2H$  gives Hydro-  
 ipecamin  $C_{28}H_{38}N_2O_4$

Hesse goes on to say that emetin has no emetic properties and that only contamination with other alkaloids makes it emetic. Cephaelin is the type of the two pairs of alkaloids noted, and with emetin is the most important principle in ipecac. He finds that emetin hydrobromide is considerably easier to purify than the hydrochloride. Especially is emetin hydrochloride hard to separate from ipecamin hydrochloride. He, therefore, recommends emetin hydrobromide as the preparation of choice. Against its clinical use, however, is its difficult solubility. He lays the chief danger in emetin to contamination with the strongly toxic cephaelin.

Carr and Pyman (*Journal of the Chemical Society*, 1914, 1591) arrive at a slightly different formula for emetin, making it  $C_{29}H_{40}N_2O_4$ . They state that psychotrin plus  $2H$  gives cephaelin and cephaelin plus  $CH_2$  gives emetin. Emetin can be prepared from cephaelin by methylation and this process gives a substance identical with native emetin. Emetin is a levorotatory base which yields dextro-rotatory salts. It can be prepared as a colorless white amorphous powder, or as a clear varnish. It has the general solubilities and properties of alkaloids, being soluble in alcohol, ether and chloroform,

and but sparingly soluble in water. Emetin hydrochloride, which is the salt chiefly used because of its solubility in water, crystallizes in colorless woolly needles or in thicker transparent prisms. It has no sharp melting-point. It is slowly soluble in cold water, forming a saturated solution of about 13% at 18 degrees Centigrade. It is the most soluble of all the emetin salts.

There is practically no literature so far available on the action of emetin as obtained in pure form by the Hesse method. All data are on the purest emetin to be had at the time commercially. This, however, has been proved by Levy and Rowntree (*Archives of Internal Medicine*, March 15, 1916) to vary in toxicity and action within comparatively wide limits according to the methods of manufacture of the various purveying firms. This is a matter of the utmost importance, and attention is urgently required to control the standardization of emetin preparations on the market. The data here presented, being the result of work on the older emetin which is now that in ordinary use, may be more or less modified by future experimentation with pure emetin. But thus far only the ordinary commercial preparations have been available.

The local action of emetin consists of a profound irritation of all contiguous tissues, which is at first inflammatory and later goes on to ulceration and necrosis. Inhalation of the powder of ipecac causes marked respiratory distress, which takes the form of the so-called "emetin asthma," with oppression in the chest and difficult breathing, from the local irritation. Irritative symptoms are likewise produced in the eyes and upper respiratory passages. If applied to the skin in an ointment, emetin causes irritation tending to pustulation. Subcutaneously also it produces a marked irritation, with pain, swelling, stiffness of the part, ulceration and sometimes necrosis.

Emetin has been shown to have a depressant action on the heart and circulation. A single moderate or large dose shows no effect, but repeated small hypodermic doses produce a serious fall of blood pressure in animals, with a small fast pulse. This is a symptom of poisoning and may not be elicited in the therapeutic use of the drug. Various observers at times have noted a peculiar cardiac irregularity which Levy and Rowntree have shown to be due to a coarse ventricular fibrillation. The fibrillation is first generalized. Then the auricle ceases to beat, becomes engorged and dilates. The heart ordinarily stops in diastole and this stoppage is synchronous with respiratory failure. This cardiac effect in animals was unaffected by cutting the vagi. In some cases the normal rhythm is resumed after a temporary period of fibrillation. Cephaelin has a more profound influence on the blood pressure than has emetin, but the latter is more toxic to the



heart itself. Death in emetin poisoning comes from cardiac failure.

On the gastro-intestinal tract emetin seems to act as a general irritant, producing vomiting and diarrhea when the dose is sufficient. Anorexia, gastric distress and headache occur. Hesse claims that pure emetin has no emetic action and that the alkaloid is therefore misnamed, its emetic properties being due to an admixture of cephaelin. But the consensus of opinion is to the effect that emetin does act as an emetic. Wild found the emetic action of cephaelin to be double that of emetin. Emesis seems to be invoked only when the alkaloid is administered by mouth, except possibly when toxic amounts are injected. The writer has seen several cases where emetin was administered in keratin coated pills and produced violent diarrhea, colic and tenesmus. The ordinary preparations certainly have a marked emetic action when given by mouth. It has not been definitely determined whether there is an interrelation between the emetic action and the effect on the circulation, particularly on the blood pressure. Emetin has an action on the respiratory tract which is most likely secondary to a mild degree of nausea.

An important addition to the knowledge of emetin action is recorded by Levy and Rowntree who report the observation of Professor Howell to the effect that the blood of emetin-poisoned animals clots with unusual slowness and that the clot is non-retractile in character, soft and of a jelly-like consistency, "showing no visible structure whatever under the ultramicroscope, whereas the normal clot shows a mass of interlacing needles or spicules." No characteristic or pronounced change is produced in renal function until the terminal stage of poisoning.

The action of emetin as an amebicide was first demonstrated by Vedder and is the basis of its employment in amebic infections. It destroys the vegetating amebae but seems not to affect cysts. So that practically the symptoms of the action of the drug are in reality by-products which are not necessary or even desirable in its therapeutic administration. The few exceptions to this will be taken up under the uses of the drugs. In considering the pharmacology of emetin even thus briefly, mention should be made of the use of chaparro amargoso, a Mexican plant, which has an action similar to ipecac and may contain similar principles.

#### TOXICOLOGY.

The symptoms of emetin poisoning are comprehended in the statement of the physiological action, as the therapeutic effect is only or rather is chiefly amebicidal. The ordinary symptoms of poisoning consist of gastro-intestinal irritation, low blood pressure with fast weak heart, general depression of the central nervous system and often a condition scarcely

to be distinguished from acute beriberi. The gastro-intestinal irritation is apt to appear quicker and to be more violent if emetin has been administered by mouth. It has been claimed that emetin stimulates the vomiting centre in the medulla, but the observation is not well substantiated, and the extreme infrequency of vomiting when emetin is administered hypodermically argues against it. However, Allen reports (*J. M. A.*, 1913, 664) a case of emetin poisoning following hypodermic injection of four grains of emetin where there was nausea and some vomiting. Diarrhea with blood, mucus and much pain and tenesmus may occur after the use of emetin hypodermically, and the mechanism of its production is not clear. The manner of excretion of emetin has not been determined. If it is excreted through the large intestine this might account for the action. But no trace of ipecac alkaloids could be recovered by Lowin from gastric or intestinal contents or from the urine. (*Arch. Internat. de pharmacol. et de Therap.*, 1902, xi, 9.) Lyons moreover was not able to show any amebicidal action of the sterilized stool filtrates from individuals who were taking ipecac by mouth. (*New Orleans M. and S. Jour.*, 1912, 881.)

It is hard to dissociate the circulatory effects of emetin from its poisonous action on the gastro-intestinal tract. The difficulty of recognizing these poisonous symptoms is greatest in the condition where above all others the use of emetin is important,—amebic dysentery. Here not infrequently the diarrhea from emetin is confused with the amebic diarrhea, and the drug is continued or increased to a dangerous degree. The same errors may arise in the attempt to treat non-amebic dysenteries with emetin. Here the diarrhea not yielding and later being increased by the emetin, a poisonous effect may unwittingly be secured.

In the use of emetin in China I have seen a few cases of mild poisoning. One group has been noted. Another variety exhibits itself in an exaggerated local reaction to the hypodermic injection of emetin with extreme pain, swelling, erythema locally, and stiffness lasting for several days. The preparations used were uniform with those used in other cases where no such symptoms developed. Such cases suggest the probability of an idiosyncrasy to emetin, and this must always be held as a possibility in constitutional symptoms of poisoning. This view is further supported by the observation in Sollman's Textbook of Pharmacology, p. 309, that certain individuals are so sensitive to ipecac, that a jar opened at a distance of several feet will produce violent sneezing and discomfort. Low (*B. U. J.*, Nov. 13, 1910, p. 176) has noted the same thing as of not infrequent occurrence, and in consequence he prefers intramuscular to hypodermic injection, believing that thus the local reactions are eluded. Whether or not this idiosyncrasy partakes of the nature of



a specific body sensitization, it is impossible as yet to say.

It has been noted by many observers that emetin poisoning gave a clinical picture indistinguishable from acute beriberi. Various physicians in China have seen this occurrence. Levy and Rowntree have collected 20 reported cases of emetin poisoning, including two of their own, in twelve of which peripheral neuritis of varying degree was a prominent symptom. Peripheral neuritis is not an infrequent complication of bacillary dysentery, and is also seen in no small percentage of cases of amebiasis. The possibility, therefore, must not be overlooked that a beriberi or pseudo-beriberi condition may arise in dysentery and be credited to emetin. The fact must be borne in mind, however, that beriberi is common in China and in many other districts where dysentery flourishes, and that an acute dysentery may conceivably determine the onset of an acute beriberi in an individual already the subject of a vitamin deficiency, and also that emetin itself may be the provocative agent. The subject of the nature and mode of action of the exciting factors in acute beriberi have by no means received the attention they deserve. J. Preston Maxwell, in Fukien Province, South China (*C. M. J.*, July, 1915, p. 283) records his observation that a neuritis very similar to beriberi may follow dysentery. He reports such a case in a student of his own, who was cured by emetin of an amebic dysentery accompanied by neuritis. Later he had a second dysenteric attack and received exactly the same emetin treatment, plus a diet of unpolished rice. No neuritis developed. However, on the evidence at hand, muscular weakness, peripheral neuritis and depression of the central nervous system must be put down as possible accompaniments of emetin poisoning, especially in beriberi localities, even though the diagnosis of beriberi should be considered conjointly, inasmuch as the emetin may have been an exciting cause for the development of the neuritis.

In one of Levy and Rowntree's patients, who died, there was marked evidence of renal insufficiency, with nitrogen retention, acidosis and low phthalain excretion. But this may have been only partly excited by the emetin. Autopsy findings showed a luetic aortitis, chronic aortic endocarditis, dilatation of the heart, chronic passive congestion of the viscera, arteriosclerosis, chronic colitis, healed tuberculous lesions of the lungs, and bronchopneumonia. Manifestly these could not all be charged to emetin, yet the implication is clear regarding the possible danger of using emetin in such conditions.

The symptoms obtained by Levy and Rowntree in animals correspond to the clinical picture in human beings. Extreme muscular weakness, lethargy, vomiting, intense diarrhea, and the characteristic circulatory changes were

observed. The characteristic lesion in dogs was the marked gastro-intestinal inflammation.

These same authors make a contribution of particular importance in their demonstration of considerable variation of toxicity in the commercial emetin supplied by the following firms: Burroughs-Wellcome and Company (ampoules), Eli Lilly and Company (ampoules), Merck (crystals), Parke, Davis and Company (ampoules), Sharpe and Dohme (hypodermic tablets). The clinician then must regard emetin with respect, particularly when he recalls such opinions as that of Lyons (*Amer. Jour. Med. Sci.*, 1915, p. 97): "Too large doses or too prolonged use of moderate doses may cause a diarrhea or be responsible for its persistence. There is increasing evidence that large doses of emetin are not without ill effect." Vedder, too, says (*A. M. A.*, 1914, p. 501), "I wish to point out the possible danger in not using due caution in the use of this very potent remedy." To repeat, then, the emetin so far available for clinical use is not a pure alkaloid, and as supplied commercially it has a dangerous variation in toxicity. With this it needs re-emphasis that emetin has dangerous potentialities, and that the utmost caution is necessary in its clinical use.

It is evident that the question of dosage is of supreme import, and here there is considerable diversity of opinion, which is not to be wondered at in the light of the data already presented regarding the variations in commercial emetin. Rather than discuss the voluminous literature in any detail, it may be better briefly to summarize an opinion based on the writings of eminent authorities combined with some personal experience. Ordinarily the dose of emetin for an average adult should not exceed one grain in one daily hypodermic injection. After a course lasting from six to eight days, an interval of one week should elapse, and then two thirds the previous number of injections in the same dosage should be administered. Children show a relative tolerance for the drug, and so far no cumulative effect has, to my knowledge, been reported. For oral infections Bass and Johns recommend  $\frac{1}{2}$  grain daily for from three to six days. The duration and intensity of treatment are to be gauged according to the results of frequently repeated stool examinations. If marked benefit is not obtained with the course as outlined, it is probable that the diagnosis is incorrect or that the amebiasis is a complication. There is a certain danger in using too small doses in that the amebae may become more or less immunized and depressed without being destroyed, and thus become encysted and the condition unimproved. In fulminating cases it is possible that intravenous injection might be required, in which case  $\frac{1}{2}$  grain in a large diluent of saline should be the standard dose.



## USES.

**Amebic Dysentery.** The predominant use of emetin is in the treatment of amebic dysentery, and the history of the empirical use of ipecac, combined with the demonstration of the specific amebicidal action of emetin, places its use here on solid footing. In using emetin in dysentery it is important to recall that if there is to be benefit, it will usually appear early, ordinarily by the third or fourth day. Emetin seems specific in direct proportion to the acuteness of the attack. There is considerable variety in the methods of treatment of dysentery, and the subject is one of much importance, but we are concerned here only with the use of emetin. It may be said, however, that emetin must be supported by symptomatic treatment, as represented in correct diet, catharsis, rest, etc. Chronic dysentery and ameba carriers, as a rule, are uninfluenced by emetin directly, although even here there are certain favorable reports.

Low (*Jour. Trop. Med. and Hyg.*, Feb. 1, 1916) has recently published two cases of chronic ameba carriers which were treated with emetin under careful observation. Both showed the presence of numerous cysts of *Entamoeba histolytica*. These were gradually decreased in number by persistent treatment, although at first no change was seen. Finally even the cysts disappeared, whether or not permanently, the author cannot yet say. Low compares the action of emetin on the amebic cysts to that of quinine on subtertian crescents. Both are resistant to the drug. Continued administration, however, destroys the successive crops of vegetative forms in each case, and thus gradually decreases the number of cysts and crescents respectively, and eventually eliminates the infection.

**Tropical Abscess.** Amebic abscess of the liver may arise with no history of dysentery, in cases where the liver is predisposed, as by chronic congestion, fatty degeneration, or alcohol. In any case, emetin has a very definite use in the pre-suppurative stage, especially when this follows directly on an acute dysentery. After actual abscess formation, the condition becomes surgical although even then emetin may be a valuable adjuvant, particularly if the abscess has ruptured and spread amebae through the contiguous tissues. Usually the diagnosis of full-blown abscess indicates drainage, although improvement and even cure have been reported subsequent to aspiration and the relief of the local congestion by the acupuncture.

**Pyorrhea.** The work of Bass and Johns (*N. O. Med. and Surg. Jour.*, November, 1911) on amebic pyorrhea, which appeared in 1914, is too well known to need repetition. In spite of the difficulty or inability in fulfilling Koch's requirements of specificity, it has been abundantly substantiated that amebae are intimately

related to pyorrhea. Here, too, it is beyond our province to discuss the treatment of pyorrhea, except in so far as emetin is to be employed. Whether emetin alone will cure pyorrhea is an open question. It will, without doubt, cure the amebic infection, and to this end its use hypodermically and locally is indicated. But it cannot be said that emetin is a specific for pyorrhea, that emetin alone will cure it, or that pyorrhea cannot be cured without the use of emetin. These remarks are applicable also to certain bony and oral abscesses and infections other than pyorrhea. Passing mention should be made of amebic tonsillar infections which may be related to hyperthyroidism. Given the pathogenic ameba, emetin is the specific remedy for the ameba, provided the infective agent is not walled off in an abscess.

**Expectorant.** Ipecac enjoys a well-deserved reputation as an expectorant, where by virtue of the milder symptoms of nausea, which it excites, it causes a flow of bronchial secretion, coats over irritated, dry, inflamed membranes, and has a definite beneficial effect. In so far as emetin excites mild nausea, it shares in this action. Wild called attention to this use of emetin in bronchitis and catarrhal affections of the respiratory tract in 1895 (*Phar. Jour.*, L, p. 435, 1895). Evidently the old emetin, with its contamination of cephaelin or ipecamin, would serve better for this purpose than the purified alkaloid. Also, in the light of our increased knowledge of the pharmacology of the ipecac alkaloids, the older galenic preparations would seem to have certain definite advantages over emetin itself for this purpose.

**Hemorrhage.** Emetin has been lauded as almost a specific for hemorrhage in certain chronic diseases, especially for hemoptysis in pulmonary tuberculosis. Some have advocated it as a remedy for hemorrhage in typhoid, diabetes, and other conditions. There is no experimental evidence that emetin has the slightest influence on hemorrhage directly, or that under any circumstances it promotes coagulation. The observation of Howell has been quoted, that emetin in animals causes a soft, jelly-like clot, with no fibrous structure, and that the coagulation time is notably prolonged. These definite data are pitted against no small number of purely clinical observations, with no scientific controls, and even with no careful appraisal of concomitant treatment, or of the possibility of the very frequent improvement which occurs spontaneously in hemorrhage in spite of or without any form of treatment.

It is to be remembered that emetin lowers the blood pressure and weakens the heart. Thus, together with a depression of the central nervous system, which is caused, it might well be said, to increase the tendency to hemorrhage, but this is not the case, for the very use of emetin in spontaneous hemorrhages has been



orrhage. Kunkel (quoted in *A. M. A.*, Nov. 13, 1915, p. 1730) recalls an earlier belief that emetin caused anemia of the lungs and therefore tended to relieve hemoptysis and to have a beneficial effect on pulmonary tuberculosis. He traces this belief to the observation that the pulmonary vessels of animals killed by emetin were empty, a condition really attributable to splanchnic dilatation and drainage of the blood from the lungs. This explanation of the effect of emetin on hemoptysis thus calls in the lowered blood pressure of emetin, but goes on to claim pulmonary anemia as beneficial, when the opposite is now recognized, as, for instance, the rare association of pulmonary tuberculosis with a leaking left heart.

The idea of emetin as a remedy for hemoptysis originated apparently in France. Flaudin and Joltrain, for example, made a report in the *Presse Médicale*, in April, 1913, regarding the value of emetin in tuberculosis. Raeburn, in the *British Medical Journal* in the following year (p. 703), followed with an enthusiastic report which speaks for itself. He divides his cases for emetin treatment into three groups: 1. Bronchitis, where no tuberculosis could be demonstrated. If the heart was in good condition, these cases usually showed improvement, which generally continued after the emetin was stopped. This is surely far from conclusive, as the natural rejoinder is that if ipecac had been used in the place of emetin, improvement might well have been still faster. 2. Cases of clinical tuberculosis with no tubercle bacilli in the sputum. Raeburn here admits that improvement might have been charged to diet and hygiene, but thinks there was a really beneficial action in the congestive stage. 3. Cases with tubercle bacilli in the sputum. Here his results were much less regular, and he draws no conclusion of specific improvement. One may conclude justly that the emetin showed its only beneficial effect in the cases of bronchitis and in tuberculosis where the bronchitic symptoms were prominent, and that it was the expectorant action of emetin which aided, and not any direct influence on the tuberculous disease. In some twelve cases of hemoptysis in which emetin was administered, all in advanced pulmonary tuberculosis, I have failed to see any favorable effect which could not be explained by other factors more plausibly than by the emetin.

To summarize, then, in so far as emetin has a beneficial action in tuberculosis, it would seem to be due to its expectorant properties, and if so, other preparations are preferable. In so far as emetin has a beneficial action in hemorrhage, it would seem to be due to the indirect result of decreasing blood pressure, and if so, other drugs would be more effective, in that they would produce a similar result more safely and without the specific action of emetin on coagulation.

*Constipation.* Levy and Rowntree make the

suggestion, which can hardly be taken seriously from the clinical point of view, that emetin enemata would subserve a useful purpose in the treatment of constipation. Such enemata have an undoubted value when properly used for the sake of the amebicidal action of the drug, but their use as here suggested does not seem well advised.

*Other Conditions.* Like all new and widely noted remedies, emetin has been tried and commended in a great variety of diseases. But it will hardly replace Leonard Rogers' hypertonic infusion in Asiatic cholera. And few of its other applications will bear the test of careful experimentation. It has proved serviceable in the treatment of certain other diseases caused by animal parasites, especially protozoans, but the major uses have been described under its amebicidal action.

### PERIPHERAL NEURITIS FOLLOWING EMETIN TREATMENT OF AMEBIC DYSENTERY.

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It is generally accepted\* that emetin hydrochlorid has three main by-effects when used in large single doses or over a considerable time in moderate doses:

(a) *Dizziness or Nausea*, or both, coming on almost immediately after injection (especially intravenously). These symptoms pass off in a few minutes to a few hours, and we have found no serious results reported following single doses of gr. ii (.13 gm.) or less. Baermann and Heinemann<sup>2</sup> report alarming symptoms after doses of gr. v to vii (.3 to .4 gm.) intravenously,—“general vascular paralysis, severe dyspnea, loss of consciousness with vomiting, passage of thin stools and great slowing of the pulse.”

(b) *Diarrhea*. This may follow single large doses, but is usually the result of several moderate doses. Low<sup>4</sup> states that diarrhea not uncommonly occurs after five or six days of treatment with doses of gr. i to gr. ii (.065-.13) a day, but that it always stops when the emetin is omitted. The diarrhea produced by emetin may be severe enough to give stools containing blood and mucus.<sup>2</sup>

(c) *Peripheral Neuritis*, usually manifesting itself by general muscular weakness and pain, often especially marked in the legs, sometimes going on to complete wrist- and toe-drop. Vedder does not mention this complication. Lyons reports a case of his own in which 16 daily doses of gr. i 2/3 (.10 gm.) were given subcutaneously. During the latter part of the

\* The literature on emetin has been recently reviewed in several very complete papers.



treatment the patient had some muscular weakness, but especially weakness and pain in the calf muscles. Lyons also collected a few other cases from the literature,—one, reported by Eshleemann, in which "severe peripheral neuritis with general purpura" developed after receiving gr. ii (.13 gm.) a day for six days. Levy and Rowntree, in an article which has just been published,\* collected the reported cases of ill effects following emetin,—twenty altogether, including 13 cases showing symptoms of neuritis varying from muscular weakness to paralysis. Seven of these thirteen were from the clinic of Dr. E. H. Hume at the Yale Hospital, Changsha, China (report to be published later). During the past few months, in conversations with physicians from other places in China, I have learned of several other cases of varying grades of severity. Peripheral neuritis following emetin is apparently more common (in China, at least) than has been generally supposed, very possibly because the tendency lately has been to give rather larger amounts than the gr. i (.065 gm.) a day for a week to ten days, as originally suggested by Rogers and others.

The following cases are reported, both to call attention to the frequency of peripheral neuritis after emetin, and also because some of them show unusual features,—five of the cases being in one family, and another case showing a skin hyperesthesia instead of the usual muscular weakness and pain.

**CASE 1.** (Red Cross Hospital No. 158.) A white man of 38, who had had recurring attacks of amebic dysentery for eight years and had received a course of emetin six months before admission (how much he did not know). He was given gr. vi (.36 gm.)\* in four doses intravenously. Three months after his discharge from the hospital in Shanghai, he was admitted to the Massachusetts General Hospital,† stating that he had been obliged to take an average of one dose a week of gr. ii (.13 gm.) during the three months to prevent recurrence of the dysentery. Shortly after the beginning of the emetin treatment he began to have pain in the calves, and soon in all his muscles, especially noticeable in the calves, shoulder muscles and neck. At the time of his admission, two weeks after his last dose of emetin, he was still complaining that the muscles of his thighs were unstable and painful and very easily fatigued. "A few days ago his wife fell down and he ran to help her, but his legs gave way beneath him and he fell, too."

On examination his tendon reflexes were normal. He had some tenderness on pressure over the thighs.

No other cause was found for the symptoms (such as alcohol, lead, syphilis, arsenic or trichiniasis), and the pain and weakness cleared up noticeably during his stay of a week in the hospital, no more emetin being given.

This patient developed his first symptoms of neuritis after a total of between gr. x and gr. xx (.65-

1.3 gms.) of emetin had been taken and they were kept up without much change for three months by taking an average of gr. ii (.13 gm.) a week.

**CASE 2.** (R. C. Hosp. No. 732.) A white man of 32 was given six doses of emetin intravenously of from gr. i to gr. ii each. After leaving the hospital, he took "several doses" of gr. ii each intramuscularly, and after a few days reported that he had general muscular weakness and pain, which went on to complete wrist- and toe-drop. The symptoms lasted for several weeks after the emetin was stopped, but finally cleared up, leaving no traces.

A year later, he was again admitted with a relapse of his amebic dysentery and was given a total of gr. x (.6 gm.) during a week and discharged. Ten days later he again had diarrhea with blood and mucus in the stools and took gr. v (.3 gm.) in four doses. Two days after the last dose, he developed a peripheral neuritis similar to the previous attack except that it was not so severe. There was general muscular weakness—a tendency to drag the toes and difficulty in extending the wrists.

The symptoms in this case began after a total of approximately gr. xv to xx (.95-1.3 gm.) for the first attack and after gr. xv (.95 gm.) the second time. It is significant that the second time, though no symptoms appeared after the first gr. x had been taken, yet after an interval of ten days, an additional gr. v brought on the neuritis.

**CASES 3, 4, 5, 6.** (R. C. Hosp. Nos. 733, 734, 735, 736.) These were all children of the last patient (Case 2). They were admitted with him on his second admission, were given emetin, discharged, had relapses and were given more emetin at the same time as their father. All developed marked muscular weakness within a day or two after the last emetin had been given and the dysentery cleared up. The symptoms were especially marked in the leg muscles, so much so that they could climb stairs only with difficulty. Pain was present, but was not so marked as in the father. Unfortunately none of these cases was in the hospital for observation while the neuritic symptoms were present, and it is therefore impossible to report the condition of the reflexes.

The total amounts of emetin given in the hospital and later, with the ages of the patients, are as follows:

Case.	Age.	Total Emetin	Single Dose
3	8	gr. vi (.36)	gr. 2.3 (.04)
4	7	gr. xss (.36)	gr. 2.3 (.04)
5	5	gr. iv (.25)	gr. 1.2 (.03)
6	4	gr. iv (.25)	gr. 1.2 (.03)

All of the emetin in these four cases was given subcutaneously.

**CASE 7.** (R. C. Hosp. No. 957.) A Chinese man of 21. He was given gr. xv (.9 gm.) of emetin in daily doses of gr. i, some of the doses being intravenously and some subcutaneous. On the evening of the last day of the treatment he had a severe chill, sensations over both feet and legs, and tremors. This was present next morning, but cleared up. Then he became ill again, with a severe chill, which interfered with his work, and a general muscular weakness, which was not relieved by rest. He was given gr. vi (.36 gm.) of emetin subcutaneously on the following day, and the symptoms cleared up. He was discharged on the following day. All of the emetin was given subcutaneously.

\* The preparation used in all the cases was Parke, Davis & Co. emetin hydrochloride, sublin tablets.

† During my internship on the service of Dr. R. C. H. I met him whom I am indebted for permission to report this case.



finally became unable to walk at all on account of the pain and tenderness.

On examination, there was tenderness to pressure over the soles of both feet. There was no tenderness or pain in the calves or in other muscles. There was no disturbance of sensation to temperature or touch. There was no edema. Knee jerks normal. No plantar reflex obtained.

No more emetin was taken and the symptoms gradually cleared up during the course of about a month.

#### EXPERIMENTAL WORK.

Levy and Rowntree<sup>5</sup> have made a résumé of the literature and an exhaustive experimental study themselves. The points of interest may be briefly summarized thus:

1. The toxicity of emetin varies widely in the various preparations on the market, and even in different lots of the same preparation.

2. The toxicity when given intravenously varies with the dilution and the rapidity of injection, as well as with the amount, and with individual susceptibility. Comparatively small doses given quickly in concentrated form are more toxic than large doses, given slowly in very dilute form.

3. The principal toxic effects in experimental animals correspond with those noted in clinical work,—vomiting soon after large doses, diarrhea after repeated doses, etc. In dogs there is a lowering of the blood-pressure, marked even when non-fatal doses are given. A cardiac arrhythmia is sometimes produced, shown by electrocardiograph to be a coarse ventricular fibrillation. Respiratory effects are noted only just before death. There is interference with the blood-clotting mechanism,—the coagulation time being delayed. Albuminuria occurs incessantly.

Dogs show at autopsy a gastroenteritis,—often hemorrhagic, with marked congestion of the abdominal organs.

Dale<sup>6</sup> also, in a preliminary note, reports that cats and rabbits die after repeated moderate doses, and that kidney and liver lesions have been demonstrated, but he has not yet described them in detail.

In the literature available, no report has been found of the production of peripheral neuritis with emetin in experimental animals. Experiments on dogs, to be reported later, have been begun at this laboratory, with this end in view. So far, some of the dogs have died with gastrointestinal symptoms, and with lesions obviously corresponding to those obtained by Levy and Rowntree and others, without developing symptoms of neuritis. One dog, however, showed a quite definite paresis of the hind legs for 24 to 48 hours before death. This dog had received doses somewhat smaller than the others. We hope, therefore, by varying the size of the doses,

and perhaps by finding susceptible animals, to produce a peripheral neuritis which may be studied.

#### SUMMARY AND DISCUSSION.

1. Peripheral neuritis after emetin is not uncommon.

2. The symptoms most commonly met with in post-emetin neuritis are general muscular pain and weakness, usually most pronounced in the legs, sometimes going on to paresis. One case is here reported of hyperesthesia of the soles of the feet without other symptoms.

3. The neuritic symptoms often develop after the emetin injections have been stopped, and may grow progressively worse for some time, with no more administration of the drug.

4. The total amount of emetin necessary to produce neuritis varies greatly. The total amounts received by the cases recorded by Levy and Rowntree and those reported here are as follows:

		Grains.	Grams.	
(a)	Adult	19.5	(1.25)	Severe neuritis.
(b)	"	6.	(.39)	Severe neuritis.
(c)	"	21.3	(1.40)	Mild neuritis.
(d)	"	12.8	(.85)	Moderate neuritis.
(e)	" about 10.		(.65)	Mild neuritis.
(f)	"	15.	(.95)	Moderate neuritis.
(g)	Age 8	6.	(.39)	Mild neuritis.
(h)	" 7	5.5	(.36)	" "
(i)	" 5	4.	(.26)	" "
(j)	" 4	4.	(.26)	" "

On the other hand, many patients receive larger amounts and have no symptoms. On going over the records at this hospital for 18 months, it was found that one white patient had received gr. xiii (.85 gm.), three Chinese had gr. xi to xii, and one gr. xxi (1.35 gms.) with no symptoms of neuritis recorded.

5. The prognosis is good. The symptoms clear up gradually, usually over several weeks, leaving no traces apparent.

6. Experiments (now in progress) suggest that peripheral neuritis may be produced by emetin in healthy dogs.

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# DYSTONIA MUSCULORUM DEFORMANS— OPPENHEIM'S NEW DISEASE OF CHILDREN AND YOUNG ADULTS.\*

BY ISADOR H. CORIAT, M.D., BOSTON.

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IN 1911, Oppenheim<sup>1</sup> described a new and peculiar disease occurring in young people of Russian or Galician Jewish parentage, which he termed *dysbasia lordotica progressiva* or *dystonia musculorum deformans*. On the basis of four cases he attempted to separate the disorder from the tics, athetoses and the various muscular spasmodic states occurring in hysteria. At first the racial predilection of the condition suggested a comparison with amaurotic family idiocy, in fact so much so, that in 1912 Bergman<sup>2</sup> was enabled to make the rather positive statement that "the disorder has up till now been observed only in patients of Jewish extraction." More recent studies have shown that while the disease is pre-eminent among young Hebrews, yet it is not absolutely limited to them, as a few cases have been reported in Christian subjects. Since Oppenheim's original contribution, cases have been published by Belling,<sup>3</sup> Fraenkel,<sup>4</sup> Ziehen,<sup>5</sup> Schwalbe,<sup>6</sup> Flantau,<sup>7</sup> Haenisch,<sup>8</sup> Abrahamson,<sup>9</sup> Bernstein,<sup>10</sup> and Bergman.<sup>11</sup> Nearly all of these cases have occurred in young Jewish children.

The disorder presents many striking features which have hitherto been undescribed. The diagnosis is rather difficult to make, and can be determined with certainty only after long observation. In fact, all who have observed the disease emphasize the diagnostic difficulties. The clinical picture of the condition seems to lie between hysterical scoliosis or *dysbasia*, *idiopathia bilaterale athetosis* and infantile pseudobulbar palsy. The Merzbacher-Pelizaeus syndrome (aplasia axialis extra-corticalis congenita) may also occasion some confusion, but the strongly organic nature of this disorder and the hereditary predisposition ought to clear up the diagnosis.<sup>7</sup>

The real nature of the disease is doubtful. Two of my cases, for instance, resembled hysteria, while the third, which I had the opportunity to study over a long period of time, possessed certain features which suggested an organic basis for the disorder. Oppenheim is inclined to believe that the condition is organic rather than functional, principally, it would appear, on the basis of his previous work on infantile bulbar paralysis with athetosis, and

on the practically negative results of psychotherapy. However, since hypnosis was the only psychotherapeutic procedure utilized, the failure of hypnotic suggestion does not militate against the functional nature of the condition, since, up to the present, no case has been submitted to a complete psycho-analysis. Djerine<sup>12</sup> classifies the condition under the athetoses. I am inclined to believe that we may be dealing with two separate groups of disease pictures, fundamentally different, but identical clinically, and which further observation and study may perhaps separate.

The fact that the disease appears in the children of unaffected parents shows, that like amaurotic family idiocy, a recessive factor is at work. Although no specially strong familial trait can be demonstrated, yet one of my cases had a brother who seemed to possess an abortive form of the disease, but which has not progressed for the last two years. In Schwalbe's description of a similar disturbance, three of the cases were sisters, which would suggest a familial tendency to the disorder. The disease usually occurs in children between the ages of eight and fourteen, although since Oppenheim's original paper, the condition has been reported in young adults, one of my cases being twenty-eight years of age.

The clinical picture is strange and peculiar. The onset is slow, involving first either the upper or lower extremities, and appearing either as tremor of the arms, spasticity of the legs or some disturbance in gait. The gait is stiff and hypertonic; there may be a cross-legged progression or it may resemble that of a muscular dystrophy. One of my patients waddled like a duck. The gait may be similar also to the *dysbasia lordotica* of hysteria, and it was this circumstance which led to the condition being interpreted by Ziehen as a tonic torsion neurosis or as a pure hysterical disturbance. Twisting of the spine, tilting of the pelvis, lordosis and lardo-scoliosis are marked. Characteristic of the condition is the fact that the muscular disturbances tend to diminish or cease when the patient is at rest, but reappear very rapidly as soon as there is any attempt at voluntary movement.

There is a very rapid muscular fatigue in walking. Some of the muscles, particularly those of the neck, show a marked hypotonicity, causing the head to fall forward on the chest. While the patient is at rest, peculiar movements of the limbs may take place, not particularly athetoid or choreiform, but partaking of the nature of both. Such movements are inconstant, however. A combination of rigidity and tremor may also be found. There is no paralysis, atrophy, electrical changes, sensory disturbances, involvement of the sphincters, cranial nerve paralysis, speech abnormalities or mental disturbance. The condition of knee jerks is inconstant; they may be diminished, normal or

\* Read before the Forty-third Meeting of the New England Pediatric Society, March 31, 1916.

† For a minute study of this disease see Merzbacher's original monograph, published in 1910. Also in English "An Unusual Type of Hereditary Disease of the Nervous System," by F. E. Mitten and D. Wilkinson, *Brain*, 1914.



even exaggerated. Facial grimacing has also been observed, and in one of my cases, attempts at voluntary movements of the upper extremities brought out a condition suggestive of a cerebellar disorder.

That the condition had been observed for some time before it became elevated to the dignity of a nosologic entity, is shown by the following passage from the fifth edition of Oppenheim's text book, which was published several years before the appearance of his description of the disease. The reference is to a disturbance of the gait in hysteria, and it will be observed that this description bears a striking resemblance to his later account of dystonia musculorum deformans. "In one of my cases, which followed influenza, the waddling gait was exactly like that of dystrophy; the patient would not keep the trunk erect in sitting, but had to support it with her hands. The paralysis was localized in the lumbar-pelvic thigh muscles, but there was no atrophy or pseudohypertrophy, and the influence of suggestion made its hysterical nature evident."<sup>13</sup> Thus it will be observed that, even before the symptoms had been studied in a group of cases, the condition was considered a pure neurosis, pre-eminently of an hysterical nature.

For the present, the true nature of the disease must remain in the dark, partly because of insufficient clinical material and partly because neither pathological reports nor complete psycho-analyses are available. Evidently the disorder is not purely hysterical, since suggestion has been ineffective in ameliorating the symptoms, and none of the cases seemed to follow an emotional shock. One of my cases, however, showed certain characteristics of a traumatic neurosis, while the other occurred in a highly neurotic Hebrew patient. If the condition is hysterical, future investigations will probably clear up its psychogenesis; if organic, the lesion is probably in the putamen and the caudate nucleus, the same as Oppenheim and Vogt<sup>14</sup> found in certain cases of infantile bulbar paralysis with athetosis. The precipitating causes of the disorder are somewhat clearer, and suggest a certain analogy with hysteria. In Flatau's two cases, for instance, the condition followed an injury to the leg; in one of Schwalbe's cases, it appeared after an emotional shock; while in two of my cases emotional factors in the etiology could be incriminated to a certain extent.

The following three cases came under personal observation:\*

CASE 1. A., age 9, a Russian Jewess, was the eldest child of parents free from any neurotic tendency. She was always well with the exception of measles. A week following a fall down two steps, in which she did not complain of any injury at the time, she began to walk "crooked" but without any

complaint of pain. At first the right foot was affected, but under the application of a plaster-of-Paris bandage, in a few days she walked without any further evidence of a limp. At the time the diagnosis of hysteria was made. Shortly after the application of the plaster bandage was made, she began to walk lame again. A neurological examination at that time revealed the following symptoms:

Grasps good, strength and movements of arms normal. Movements of leg joints free. She walks with a marked contraction of the muscles of the right calf, but when lying down the contraction disappears. The knee jerks are lively and equal and there is a patellar twitch on both sides. Plantar reflexes normal. No Babinski. Testing of the knee jerks or sometimes manipulating of the leg at the ankle joint, produces a contraction of the calf muscles. Pupils normal. There is no disturbance of sensation to touch or pain. Tenderness in both iliac fossae, particularly on the left. No tenderness along spine.

The condition remained about the same for nearly six weeks. A tenotomy of the hamstring muscles was ineffective in altering the muscular spasm. An examination at this time revealed a tendency to hyperextend the right leg at the knee and to rotate the right leg outward in walking. Voluntary movements at the ankle, knee and hip joints can be performed, but rotation of the leg brings on a muscular spasm. Shortly afterwards the condition became decidedly worse. For several weeks, she was unable to sit down, since when, placed in a normal sitting posture, the body assumed the position of an opisthotonic arc de cercle, with jerky movements of the buttocks. In walking, she repeatedly jerked the body backwards and walked in a waddling duck-like manner, with the knee and hip semi-flexed. The right knee joint was particularly the seat of a strong contraction and she was unable dorsally to extend the foot. Unfortunately, this patient disappeared from observation and could not again be traced.

CASE 2. B., male, age 29, Russian Hebrew, upholsterer. The family history is negative except that the father had been a sufferer from chronic bronchitis for a number of years. He had worked steadily at his trade and there had never been any serious physical disease. Married six years, three healthy children, the youngest of whom was ten months old. There was a history of coitus interruptus for years on account of poverty. For four years there had been a complaint of a sensation of numbness of the left side of the body, without, however, in any way interfering with his work.

Several days previous to being seen, without any definite precipitating cause which could be ascertained, he suddenly began to suffer from peculiar attacks of trembling and a disturbance of gait. These attacks were not constant, but took place perhaps every fifteen minutes or so. In the normal interval, any sudden noises, even music, sudden changes of position, or the swallowing of food would produce an attack. The voice became weak and hoarse, he appeared easily frightened, with a facial appearance of extreme anxiety, and he was constantly looking to his family for sympathy, which, needless to state, made the attacks more severe and frequent. There were no gastric disturbances and with the exception of over-anxiety, the mental condition was normal.

*Examination.* Trembling of the entire body with

\* Case 1 is from the Neurological Department of the Boston City Hospital (service of Dr. Thomas). Cases 2 and 3 were seen privately.



a facial appearance of distress, weakness and anxiety. He whimpers a great deal, speaks in a weak voice, which at times becomes a hoarse whisper, resembling a partial hysterical aphonia. Observation shows peculiar attacks of muscular spasm influencing the position of the body and the gait. These attacks strongly resemble an hysterical dysbasia lortotica. The attacks begin with a look of distress and anxiety, then a trembling of the entire body, and in an attempt to walk he throws the head backwards, walks very slowly with a marked lordosis of the spine, particularly in the lumbar region, bending of the knees and balancing movements of the arms. Under these conditions the gait becomes waddling, like that of a duck, and at times it is strongly suggestive of a muscular dystrophy. In the attack after an initial tremor of the trunk and limbs, the arms and legs become rigid and spastic, the spasticity being of the tonic variety. The muscles of the spine also become spastic and it is this spasticity that produces the lordosis. The contracted and spastic muscles become rapidly fatigued, the spasm then slowly relaxes and the attack ceases after five to ten minutes. Even between the attacks, however, there remains a certain amount of a lordotic dysbasia with rigidity of the spinal muscles and a tendency to bring the edges of the scapulae close together. It seems as if the muscular fatigue were responsible for the cessation of the individual attacks and as the fatigue disappears, a new attack takes place. The attacks can also be produced experimentally by sudden noises or by sudden changes of position of the body and tend at times to cease when they are ignored by indifferent questions, even at the height of the attack and before the onset of the muscular fatigue. No difficulty in swallowing and no globus. No tachycardia in the attacks. The condition is most liable to take place on attempts at walking, since when he lies down the muscular spasm relaxes.

The pupillary reactions and the ocular movements were normal and there is no nystagmus. Visual field not contracted. Tongue central and tremulous. No tremor of the outstretched hands. Knee jerks and Achilles jerks much exaggerated. Double spurious ankle clonus. No sensory disturbances to pain or touch. Sphincters normal. Heart negative. No paralysis.

Under the administration of bromides, rest and suggestion, with purposeful neglect of the symptoms, the dysbasia disappeared within a week's time and has not since returned after more than six months.

#### CASE 3. C., age 7, a Russian Jewess.

*Family History.* All the ancestors were born in Russia and it is interesting to note that the family had the same social background of poverty, mental anxiety and persecution, as has been observed in my studies on amaurotic idiocy. Grandparents healthy. On the maternal side an uncle has tuberculosis, an aunt is neurotic, another uncle suffers from chronic lead poisoning, while a paternal aunt has been hemiplegic since childhood. When the mother was six years old she had to work hard, and up to eleven years of age had scarcely enough to eat. At eleven, she sewed as a dressmaker's apprentice and during her entire life she has been under a severe physical and mental strain under conditions of extreme poverty. The father has also been under a severe strain all his life, yet both father and mother show no evidence of any neurosis and are physically strong and healthy. There are five children in the

family. The mother has had no miscarriages. The two children who are younger than the patient, likewise a sister who is one year older, are strong and healthy. The eldest brother, act. 13, shows a tendency to nystagmus, and has slightly unequal pupils and knee jerks. He has no muscular spasm or tremor. The patient is the third child. Since the descent of the disorder is through similarly unaffected stock, the condition must be due to a recessive factor according to the scheme of Mendelian inheritance.

*Personal History.* The child walked and talked at a normal age and was well and strong up to shortly after she was five years old. Following a tonsillectomy, tremor of the right hand and a stiffness of the left foot was noticed. Then she began to stagger in walking and running, locomotion became cross-legged, the head bent to the left and began to shake and a marked curvature of the spine developed. No incontinence of urine or feces. No headache, vomiting, abnormal salivation or blindness. No complaint of pain and no hyperacusis. No evidence of mental deterioration.

*Examination.* The child is well nourished and of normal size for her age. No signs of any mental deterioration. As the child sits up, which she can do only with assistance, the head falls to the left and shows a fine tremor, there is a marked kyphosis of the dorsal spine and also a lumbar lordosis. While the lower spinal muscles appear to be spastic, yet the hypotonia of the neck and cervical muscles is so marked that the head falls forward on the chest. The thigh and hamstring muscles are in a condition of hypertonia, likewise the anterior tibial group, thus keeping the big toe of each foot in a condition of hyperextension. She can walk only with assistance and then the gait is of the cross-legged projection type. The adductors of the thighs are in a state of spasm. Right thigh rotated outwards and left thigh rotated inward, thus tipping the pelvis to a certain extent. There is no muscular or fibrillary twitching.

As the child is at rest, but becoming greatly increased on voluntary movement, there are observed constant, restless and slow choreiform movements of the arms. In attempting to grasp objects, the choreiform movements of the arms became jerky, discontinuous, awkward, and associated with a coarse tremor and ataxia, resembling the dysmetria of cerebellar disease. The tremor is absent during repose, but the choreiform movements are constant, though less marked than on attempts at voluntary movement. All attempts at movement produce a rapid fatigue. Thus the peculiar restlessness is much reduced when the patient is quiet, and becomes markedly visible only on voluntary movement.

A further analysis of the movements of the arms revealed the following: Constant restless and slow choreiform movements of both arms. On account of the muscular spasm, she is unable fully to open the left hand, which remains semi-flexed. On attempting to grasp a tumbler, the movements of the right arm became jerky, discontinuous, excessive, and likewise very awkward, resembling the condition seen in hereditary ataxia or after destruction of the cerebellum in monkeys.

Pupils equal and react promptly to light and accommodation, both directly and consensually. No nystagmus. Fundi normal. No muscular atrophy. Speech normal. No facial palsy. Tongue central, without tremor. Knee jerks exaggerated and equal. No Babinski or Oppenheim reflexes, although co-



stimulation of the right plantar surface, there is an inconstant and apparently voluntary extension of the big toe. Achilles jerks absent. No ankle clonus. No sensory disturbances to pain or touch could be demonstrated, even on the most careful testing with von Frey's hair esthesiometer. On attempts at exertion the child perspired profusely and became rapidly fatigued. No hyperaesthesia.

The patient was kept under observation for about a year. During this time the peculiar movements of the arms on voluntary movement became more marked and the hypertonicity of the muscles, particularly of the legs, increased, finally rendering walking impossible. With all this, there was no muscular atrophy, abnormal reflexes or mental deterioration. The neck muscles, however, remained hypotonic. Speech became somewhat bulbar and indistinct and there was a moderate degree of drooling of saliva, without, however, any atrophy of the tongue or difficulty in swallowing. None of the muscular incoordination was increased when the eyes were closed. Massage, motor re-education and the use of sedatives, were ineffective in ameliorating the condition.

In discussing this material, which, unfortunately, is small on account of the rarity of the condition, several factors stand out prominently. All the patients were of Russian Jewish origin, and their ancestors had been subjected to physical strain and persecution, the same ancestral history which we have found in our investigations of amaurotic idiocy. In two of the cases the family history was negative; in the third, certain neurotic tendencies were clearly defined. In all the cases, the disorder appeared in the descendants of unaffected stock, thus corresponding to a recessive condition, according to the Mendelian laws of heredity. Here again the comparison with amaurotic idiocy is rather striking.

The first two cases strongly resembled an hysterical dysbasia, but without any corresponding sensory disturbances; in the third case there was evidence of some organic affection of the nervous system as shown by the spasticity, the gait, the bulbar symptoms and the variations in the muscular tonicity, yet lacking the usual pathological reflexes of the spastic group of diseases. This latter case possessed certain features which were strongly suggestive of a Friedreich's ataxia, but after prolonged observation, it seemed warranted to place it in the group of the dystonias. In one case the condition followed a slight trauma, in another it appeared after a tonsillectomy, while in the third, it was engrafted on a highly neurotic and probably latent hysterical individual.

The prominent features in all the cases were the peculiar gait, the changes in the muscular tonicity, and the rapid onset of the disease without any pathological reflexes or changes in sensation. All reported cases of the disease show that it begins in an extremity: in our first case in the right foot, in the second case in the leg, in the third case in the right hand and left foot. The onset in this latter

patient exactly resembled the beginning of the disease in Flautau's two cases, and on which he lays considerable diagnostic emphasis.

The disorder presents certain difficulties of diagnosis because of its obscure relationships to hysteria, on one hand, and to organic diseases of the nervous system on the other. For this reason it is difficult to place the condition in any definite nosological entity at present. Possibly we may be dealing, as suggested at the beginning of this paper, with a varying pathological condition, but with an identical clinical symptomatology.

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## Society Report.

### NEW ENGLAND PEDIATRIC SOCIETY.

A MEETING OF THE NEW ENGLAND PEDIATRIC SOCIETY WAS HELD AT THE BOSTON MEDICAL LIBRARY ON MAR. 31, 1916, THE PRESIDENT, DR. A. C. EASTMAN OF SPRINGFIELD, IN THE CHAIR.

The following papers were read:

- I. DYSTONIA MUSCULORUM DEFORMANS, OPPENHEIM'S NEW DISEASE OF CHILDREN AND YOUNG ADULTS.\*

By ISADOR H. CORLIAT, M.D., Boston.

- II. FURTHER EXPERIENCES WITH HOMOGENIZED OLIVE OIL MIXTURES.

By MAYNARD LADD, M.D., Boston.

- III. A STUDY OF FIRST EXAMINATION, WITH A REPORT OF FIFTY CONSECUTIVE PHYSICAL AND MENTAL EXAMINATIONS OF SO-CALLED WELL CHILDREN.

By WILLIAM R. P. EMERSON, M.D., Boston.

#### DISCUSSION.

DR. BARRON (Dr. Emerson's paper): I have a few statistics along the line of Dr. Emerson's investigations which I would like to present to the Society.

\* See JOURNAL, page 383.



Dr. Howard, and lately I have been associated with him, has been carrying on somewhat similar work during the past 15 months. We have records of 176 examinations of children, varying in age from three to four years up to 17 or 18. Of those 176 children, 165 have defects, or 93+%. Of those who have more than one defect there are 108= at less than 62%. The total defects of the 176 children equal 354; out of these 354, 145 were remediable, such as carious teeth, tonsils and adenoids, and things of that sort. I looked up the statistics this morning and they apparently show as high a percentage of defects as the children which Dr. Emerson has seen at the Little Wanderers' Home. In addition to these we have a large number of children under two years, some of whom would undoubtedly add to these total figures. From present indications the tabulated results of these examinations indicated data of sufficient value to warrant publication later.

Dr. STONE (Dr. Emerson's paper): I have brought with me just a few figures to represent some of the work which is being done by the school physicians of Providence along the lines of Dr. Emerson's paper. The examinations have been made of children who have been in school one-half year. All are examined, being stripped to the waist. We do not make vaginal examinations; 3926 pupils were examined in the school year of 1914-15, and of these, 1018 showed defects of sufficient importance to require notification of parents or guardians; the number of defects was 3894, which meant from one to four defects each in these 1018 children. Hypertrophied adenoids and tonsils constituted the largest number of defects, 782 children, or 19.9% of those examined being thus affected; 226 had anterior nasal obstruction and 407 had defective vision; 604 were recorded as having malnutrition or anemia and 158 had enlarged glands. These were the most important defects found. Decayed teeth are not recorded by the school physician because we have a dentist who makes a separate examination and report. He examined 4554 children during the school year of 1914-15 and found 4000 with carious teeth.

Dr. CORIAT (Dr. Emerson's paper): I would like to have Dr. Emerson explain the relation of nasopharyngeal obstruction to mental retardation. I believe that nasopharyngeal obstruction may cause a certain amount of retardation in children, but if there is any organic substratum which would lead to idiocy or feeble-mindedness, I believe then that the nasopharyngeal obstruction is merely an incident in the physical examination and bears no relationship whatever to the degree of mental retardation. In cases of idiocy or feeble-mindedness which I have had the opportunity to observe after the removal of adenoids and tonsils, a secondary examination according to the Binet-Simon test showed absolutely no improvement in the mental condition. I believe, therefore, that in a great many of these statistics there is a tendency absolutely to confuse the issue.

Dr. SMITH (Dr. Ladd's paper): I was very much interested in hearing Dr. Ladd's further reports on this particular method of feeding. I should like to ask if in Dr. Ladd's experience this method of feeding helps in any way to establish a tolerance for other kinds of fat? I have used it in a few patients, and it seemed to me in one instance after using the olive oil that subsequently that child was able to take other fats better. What is the method of getting children off of this kind of food on to other food—is it done abruptly or gradually?

Dr. TALBOT (Dr. Ladd's paper): I did not quite

catch in discussing the subject whether Dr. Ladd said all the milk was heated or not. The question has come up in my mind (I think I asked the same question last year) how much heat was generated in the process, and whether the very fact of homogenization did not cause some sterilization of the milk and in that manner change the digestibility of the casein. I have used this method in a few instances, and in one instance we had very brilliant results. In other instances the results were exactly the opposite—and my results have not been uniformly as good as those Dr. Ladd reports.

Dr. EASTMAN (Dr. Ladd's paper): Has Dr. Ladd used this method of feeding in fat eczema, and does the eczema yield to this type of food?

Dr. LADD (in closing): In answer to Dr. Smith's question as to whether this method of feeding increases the tolerance for other fats, I think that it does if continued long enough. It depends a great deal upon the severity of the indigestion and the length of time the child has been vomiting. There are one or two cases in this series where the house officer, in changing the formula, failed to indicate that the fat was olive oil. At the next visit the child had lost in weight and the vomiting had returned. The milk was changed to olive oil and the vomiting stopped and the gain in weight was resumed. This is very well illustrated in No. 10, a case of pyloric spasm. In this case the milk was stopped for six weeks at one time, and when put back on cow's fat the baby stopped gaining, vomited and had a great deal of fat in the stools. The olive oil feeding was resumed and the vomiting stopped and the child gained 42 oz. in the next 47 days. I have not tried to see how soon I could get them off of olive oil. I have been content to allow them to continue on it to the end of the first year, as the results were satisfactory, and then when the formula has reached a point where it is about that of the strength of cows' milk, I get them on to cows' milk by gradual changes, as a rule, substituting an ounce of cow's milk for an ounce of the modification, then two ounces, and so on, until the whole of the olive oil mixture has been replaced by cows' milk. I do not think, however, that these gradual changes are always necessary. There are some cases where I have had to change at once and have done so very successfully. It depends a good deal upon the length of time the child has been upon the food. The milk was not heated to 212° in all cases. The point which influenced me was the degree of peristalsis which follows the use of maltose. If there is a tendency to looseness of the bowels, a mixture that is boiled is better tolerated than one that is not.

In reply to Dr. Talbot—I stated in my paper that this method has been applied to 38 cases, of which 12 were private and 26 were in the outpatient department. I have not included in this series the older children (three, four or five years) who come into an entirely different class of feeding from infants in the first 12 or 18 months. I have also excluded a case of congenital heart of case and enlarged thymus, and two or three heart diseases have been started recently and are new cases; also one or two who had the milk for one or two days only and then for some reason stopped taking the milk from the laboratory. No cases have been excluded because of any unfavorable result.

In reply to Dr. Eastman—one of the cases (No. 2) had a great deal of eczema during the first seven months of its life, and it cleared up very rapidly after the milk was homogenized. In other cases



which have shown a tendency to eczema, the condition has improved. This result I would attribute more to the improvement in the state of digestion than to any direct action of olive oil.

DR. WALTER B. SWIFT (Dr. Coriat's paper): I have nothing especially of value to say about this condition; I have not looked it up and did not know much about it before I came to the meeting. But as I see everything through the eyes of speech these days, I was wondering if something more could be found and whether the more modern tests for speech trouble have been applied to these cases. Of course, here there is a variety in the degree of the involvement; perhaps in one case there may not have been anything in the speech, but in this last case it seems to me that something else marked and perhaps quite characteristic might show. We know already that there is a sign in the speech which distinguishes tabes from paresis; there is one in chorea; there is also a sign of tic and several others that have been lately put into the literature. These have been brought out by new and modern tests. If these tests had been applied, there might be something pathognomonic about the condition which would show. I have no doubt about the entity of this condition. Oppenheim is a very remarkable observer, and if he puts forth an entity as a new disease, it is pretty authoritative.

DR. TALBOT (Dr. Coriat's paper): Dr. Coriat has laid a good deal of stress on persecution in the forebears of these children. I wonder if Dr. Coriat has ever looked up what happens to the children of other people who have been persecuted. I would question whether persecution itself is as important a factor as Dr. Coriat seems to suggest and I wonder whether control cases have been looked up.

DR. CORIAT (in closing): In reply to Dr. Swift, I would like to say that out of my three cases, the only speech defect was in the last case. In a rather extensive investigation of the literature which I made in preparing this paper, I could find no record of any speech involvement in any of the cases reported. I have no doubt that the disease is a clinical entity. As to its fundamental basis, there is still room for considerable difference of opinion,—some of them seem merely hysterical, and others have features of an organic disorder. But I think the disease is one which, as more cases are observed, will become of increasing importance for the specialist in children's diseases, and they certainly ought to be on the lookout for the condition. I have no doubt that after we begin to recognize the condition, we shall not find it any more rare than amaurotic family idiocy.

As to Dr. Talbot's question, I fully agree with him. I do not believe that persecution has any strong etiological effect in this disease or in amaurotic family idiocy, although in the latter, where I have been able to carry out my investigations to a greater extent, it seems that the disease occurs only in children of the persecuted Jew and never in the children of the non-persecuted Jew.

### Book Reviews.

*Cancer of the Stomach. A Clinical Study of 921 Operatively and Pathologically Demonstrated Cases.* By FRANK SMITHIES, M.D.,

Gastro-enterologist to Augustana Hospital, Chicago; formerly Gastro-enterologist to the Mayo Clinic, Rochester, Minn.; formerly Instructor in Internal Medicine and Demonstrator of Clinical Medicine in the University of Michigan, Ann Arbor; Fellow of the American Gastro-enterological Association, etc. With a chapter on the *Surgical Treatment of Gastric Cancer*. By ALBERT J. OCHSNER, M.D., LL.D., F.R.C.S., Professor of Clinical Surgery in the School of Medicine of the University of Illinois; Surgeon-in-Chief to Augustana Hospital, Chicago; Consulting Surgeon to St. Mary's Hospital, Chicago. Illustrated. Philadelphia and London: W. B. Saunders Company. 1916.

Dr. Smithies' book should be owned by every medical man who is interested in cancer of the stomach, whether viewed from the diagnostic, therapeutic or preventive standpoint. It is the summary of a very great amount of personal work, which has been accurately recorded, and thoroughly studied, and which has been based upon his own wide clinical experience; to this, he adds a vast and sympathetic familiarity with the results of other observers throughout the world.

The book contains about 450 pages of Dr. Smithies' text, based upon more than nine hundred cases of gastric cancer,—cases which have been proved to be cancer by the surgeon and the pathologist. This is supplemented by 50 pages devoted to the surgical treatment, written by Dr. Ochsner.

The book is divided into twelve chapters, including the one by Ochsner; in these chapters are considered,—(1) General Distribution; Etiology; (2) Morbid Anatomy; (3) Symptoms; (4) Abnormalities; (5) Examination of Function; (6) X-Ray Examination; (7) The Blood; (8) Ulcer in Respect to Cancer; (9) Cancer in Youth; (10) Differential Diagnosis; (11) Surgical Treatment; (12) Non-Surgical Treatment. This gives a good outline of the scope of the work, and its method of attack. We would have welcomed the author's own synopsis of each chapter, had he found it possible to append it at the end of each section.

It is evident that Dr. Smithies still believes in the ultimate importance of the clinical diagnosis of cancer, as he says near the end of the chapter on X-ray Examination: "in a majority of cases (of a given series) clinical diagnosis was quite possible without the added x-ray examination; in clinically doubtful cases, the Roentgenographic diagnosis was similarly dubious."

The printing, illustrating and bookmaking are very good.



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126 Massachusetts Ave., Corner Boylston St., Boston, Massachusetts.

## PROGRESS OF POLIOMYELITIS EPIDEMICS.

DURING the past week there has been, on the whole, a steady abatement of the various epidemics of poliomyelitis. On September 8 the number of cases in New York City reached a total of 8,435 with 2,090 deaths. In New York State outside of New York City there had been, on September 6, a total of 2,401 cases with 255 deaths. In New Jersey from July 1 to August 21, inclusive, there were 2,024 cases. In Pennsylvania from July 1 to September 6 there were 1,004 cases with 260 deaths. Of these, 580 cases and 212 deaths were in Philadelphia. All schools in Pennsylvania are to remain closed until September 18. In Toledo, Ohio, there have been 95 cases with 17 deaths, and the

opening of the schools in that city has been postponed until the same date.

In Massachusetts during the month of August the total number of cases was 257 with 33 deaths. In July there were 107 cases and during the preceding six months only 30 cases. The distribution of these cases is a matter of considerable interest. It has been tabulated by counties and towns as follows:

Barnstable County—Bourne, 3; Orleans, 1; Yarmouth, 1.

Berkshire County—Adams, 4; North Adams, 20; Pittsfield, 10; Savoy, 1.

Bristol County—Dartmouth, 1; Fairhaven, 1; Fall River, 3; New Bedford, 11; Taunton, 1.

Essex County—Amesbury, 10; Beverly, 2; Haverhill, 6; Georgetown, 1; Lawrence, 3; Lynn, 1; Newburyport, 2; Peabody, 2; Salem, 5.

Franklin County—Erving, 3; Greenfield, 2; Montague, 6.

Hampden County—Agawam, 1; East Longmeadow, 3; Holyoke, 7; Southwick, 1; Springfield, 17; West Springfield, 1; Westfield, 3.

Middlesex County—Cambridge, 6; Framingham, 1; Littleton, 1; Lowell, 4; Malden, 2; Medford, 2; Newton, 3; Reading, 1; Somerville, 8; Hampshire County—Easthampton, 5; Hadley, 3; Northampton, 4.

Norfolk County—Braintree, 2; Brookline, 1; Canton, 1; Milton, 3; Norwood, 1; Stoughton, 3; Plymouth County—Abington, 1; Plympton, 1; Wareham, 4; Whitman, 1.

Suffolk County—Boston, 36; Chelsea, 1; Revere, 4.

Worcester County—Blackstone, 1; Douglas, 1; Dudley, 3; Fitchburg, 4; Hopedale, 1; Barre, 1; North Brookfield, 1; Leominster, 1; Southbridge, 4; Sturbridge, 1; Uxbridge, 2; Webster, 1; West Boylston, 1; Worcester, 5; Milford, 1; Lancaster, 1; Charlton, 2.

It will be observed that the largest number of cases has been in Boston; but North Adams, with 20 cases, has had a far higher percentage incidence, and with eight deaths has had by far the highest mortality in the present epidemic. There have been seven deaths from the disease in Boston. During the first nine days of September, 104 cases of poliomyelitis were reported in Massachusetts. There have now been sixteen cases each in Holyoke and Pittsfield, and fourteen in Amesbury since the outbreak of the epidemic. There have been a together 86 cases in Boston, 31 in North Adams, and 21 in Worcester. The Boston School Committee has voted as a precautionary measure to postpone the opening of the public schools in this city until September 25. Similar postponements have



taken place in many cities of this Commonwealth and in several of the higher institutions of learning. In many towns, however, it is planned to open the schools on the usual date.

Among the other New England States, only Connecticut has had more cases than Massachusetts. In Rhode Island there were 56 cases during the first seven months of the year with nine deaths, and 46 cases with 8 deaths since July 22. In Manchester, N. H., four new cases and three deaths were reported on September 4.

The first death of a physician from poliomyelitis during the present epidemic was that of Dr. Earl C. Peck of Newton, Mass., who died on September 5, while serving as assistant resident physician at the municipal hospital in Philadelphia. He had been engaged in the care of poliomyelitis patients. His obituary notice is published in another column of this issue of the JOURNAL.

In New York the Health Commissioner is at present devoting particular attention to the after-care of patients convalescent from poliomyelitis, and to the possible relation between this disease and the paralyzes affecting domestic animals. The following plan has been adopted by the Department for collecting data with reference to this relation:

In order that exact information may be posted as to whether poliomyelitis occurs in domestic animals, and, if so, whether the latter play any part in the transmission of the disease, all the nurses in the department, now visiting cases of poliomyelitis, have been instructed to make a special inquiry regarding animals. If they find anything suspicious they will report the matter immediately and the suspected animals will be removed by the Department of Health for observation. A veterinarian will then be sent to examine the animal, and if the suspicion is justified, the animal will be killed and an anatomical examination made.

In addition to this, arrangements have been made whereby a veterinarian of the Department will visit the shelter of the Society for the Prevention of Cruelty to Animals to see whether any suspected cases of animal infection are there encountered. In this investigation the Bureau of Preventable Diseases will have the cooperation of the Bureau of Laboratories and of the United States Public Health Service.

In Chicago the Commissioner of Health has appointed a committee, consisting of Dr. N. Herzog, Dr. K. Meyer, Dr. H. B. Thomas, Dr. A. Hoyne and Dr. A. K. Armstrong, to undertake research on poliomyelitis in that city.

## SHIPMENT OF POISONOUS DRUGS BY MAIL.

THERE has recently been introduced in the United States Congress, at the instance of the National Association of Manufacturers of Medicinal Products, a bill to amend Section 217 of the United States Criminal Code relating to the shipping of poisonous substances by mail. This bill (Senate 6834, House 17396) is known as the Kern-Doremus Bill, from the names of its proponents in the two houses. The present section of the Criminal Code above referred to forbids absolutely the transmission of poisonous drugs, even for legitimate purposes, by mail. This prohibition may prevent the mailing of emergency preparations ordered by physicians from a distance by telephone or telegraph. It has seemed to the advocates of the Kern-Doremus Bill that this article should be amended so as to exclude only drugs not outwardly or of their own force dangerous to life, health, and property and to permit the shipping by mail of poisonous drugs not thus dangerous if securely and properly prepared and packed, so as not to endanger the mails or those handling them from leaking or breakage. In accordance with this feeling the new bill has been drawn in part as follows:

"SEC. 217. All kinds of poisons and all articles and compositions containing poisons which are outwardly or of their own force, dangerous or injurious to life, health or property; and all other poisons, and articles and compositions containing poisons so insecurely packaged as to endanger the mails or those handling them from leakage or breakage, all articles and compositions herein described that are not packaged and prepared for the mails in accordance with any regulations that may be made by the Postmaster-General for their preparation and packing; and all poisonous animals, insects, and reptiles, and explosives of all kinds, and inflammable materials, and infernal machines, and mechanical, chemical, or other devices or compositions which may ignite or explode, and all disease germs or scabs, and all other natural or artificial articles, compositions, or materials of whatever kind which may kill, or in any wise hurt, harm or injure another, or damage, deface, or otherwise injure the mails or other property, whether sealed as first class matter or not; and all spirituous, vinous, malted, fermented, or other intoxicating liquors of any kind are hereby declared to be non-mailable matter and shall not be conveyed in the mails or delivered from any post office or station thereof, nor by any letter carrier."



The remainder of the bill provides penalties for violation of these provisions. The Postmaster-General is empowered to make suitable regulations respecting preparation and packing for the mails.

The intent of this proposed amendment seems just and the bill in question has been endorsed by the American Pharmacæutical Association and the American Association of Pharmaceutical Chemists. Its discussion and further consideration will presumably be postponed until the next session of Congress.

### PYORRHEA ALVEOLARIS AND ITS TREATMENT.

THE issue of the JOURNAL for August 10 was devoted largely to a series of papers dealing with different aspects and opinions relative to hay fever and its treatment. In the present issue of the JOURNAL is published a shorter series of papers relating to pyorrhea alveolaris and its treatment by bacterial vaccines or by emetin, and with some other applications of emetin therapy. Dr. Medalia, whose previous paper on this subject appeared in the issues of the JOURNAL for December 19 and 26, 1912, believes the vaccine treatment superior to that by emetin. Dr. Reed, dealing less particularly with the use of emetin in this condition, reviews the history of the drug and presents a valuable summary of its pharmacological and toxic action and its therapeutic uses. Dr. Kilgore's paper offers interesting clinical evidence of one of the complications that may follow emetin therapy.

The recognition that the teeth and their adjacent tissues may afford ready and frequent portal of entry for systemic infections is one of the important advances in medicine during the past decade. It now appears probable that this portal is really less through the tooth itself than by way of the tissues immediately surrounding it in the alveolar socket. It is not yet determined beyond question whether the infection leading to pyorrhea alveolaris is specifically due to the endameba buccalis or may be caused by ordinary pyrogenic organisms. That emetin is a specific amebicide is established beyond doubt and this drug has at least found a definite therapeutic place in the treatment of amebic dysentery. If pyorrhea be really a specific amebal infection, emetin should be also its specific drug. Unless this is definitely proved,

however, it would seem that the use of emetin in this disease should hardly be continued, inasmuch as emetin is a drug whose exhibition is attended with not infrequent inconvenience and occasional danger.

### MEDICAL NOTES.

MUNICIPAL CLINICS FOR SCHOOL CHILDREN.—The Department of Health of the City of New York has recently issued a reprint of the report of its free municipal clinics for school children, which were held in that city from 1912 to the end of 1915. During this time 1,677 children were examined and of this number, 1,605 required treatment. The closing of these clinics by the Health Department will force the children back to the dispensaries where, among crowded conditions, the manner of operation and individual attention cannot be of the highest efficiency.

While some institutions refuse to perform operations for hypertrophied tonsils and adenoids without complete anesthesia, because of lack of facilities for the proper care of the patients after operation, a large number of the dispensaries (including out-patient departments of several noted hospitals) operate upon the children in the general clinics and without anesthesia. To this is added the great risk of sending the patient home without any precautions being taken to prevent secondary hemorrhage or septic infection of the throat. This element of danger in the treatment of nose and throat cases was taken into account by the Department of Health in planning the school children's clinics. Not only must all operations be performed with complete anesthesia, but every care and precaution have been introduced from time to time.

In view of these facts the Bureau of Welfare for School Children has made recommendations to the proper authorities that these clinics be continued and suggests the use of the seven municipal halls for the housing of such clinics.

AMERICAN ELECTRO-THERAPEUTIC ASSOCIATION.—The twenty-sixth annual meeting of the American Electro-Therapeutic Association was held in New York City on September 12, 13 and 14. Among the many papers presented was one by Dr. Fred H. Morse of Boston on "Currents in Electro-Therapeutic Applications" and one by Dr. Frank B. Granger of Boston on "The Condenser Discharge in Diagnosis and Treatment." Dr. George E. Doering of Worcester, Mass., presented a paper on "The Treatment of Sub-Acromial Bursitis."

RESEARCH IN TROPICS.—Dr. E. E. Linwood Walker, associate professor of tropical medicine at the University of California, Los



been sent by the George Williams Hooper Foundation to South America, to carry out investigations on tropical diseases on the upper Amazon. Dr. Walker will be stationed 1,500 miles from the mouth of the river in the region of Porto Zelho, where a hospital is maintained by the Madeira-Mamora Railroad under the directorship of Dr. Allen M. Walker. In the laboratories of this hospital, researches on the parasitic infections of man in the tropics will be conducted.

**CHANGES IN DRUG PRICES.**—Report from New York on August 28 records a few recent minor changes in the cost of drugs. Quinine has declined 10 cents in manufacturers' hands. Glycerine has moved up to 36@37½ cents per pound. Benzoic acid has advanced to \$10@ \$11 per pound. Various important coal tar preparations have moved up owing to increasing scarcity. Salol and the salicylates are exceptions to this rule, however, the tone being easier owing to lower priced offers of carbolic acid, the base product. Camphor has been in unabated demand from smokeless powder and celluloid manufactures and the outlook favors further advances.

**BRITISH MEDICAL ASSOCIATION.**—At the recent formal meeting of the British Medical Association in London, Dr. Sir T. Clifford Allbutt was elected president of the association for the ensuing year. Dr. Allbutt was born on July 20, 1836.

**PLANS FOR NEW YORK HOSPITALS.**—In the issue of the New York Times for August 28 are recorded the plans now formulated for the rebuilding and remodeling of the Sea View Hospital for Tuberculosis on Staten Island and the Children's Hospital and Schools for Mentally Defective Children on Randall's Island, New York. A total of \$1,400,000 has been appropriated for this purpose. Mr. John A. Kingsbury, commissioner of the New York Charities Department, is reported as follows in regard to conditions and plans at the Randall Island Hospital.

"Some of the buildings in which the patients are housed were constructed in 1848, and many of them were built before 1860. These buildings have thin brick walls, with small windows and damp, unventilated basements, wooden floor beams, and wooden floors. The wood of these floors, as the result of daily scrubbing for generations, is decayed, offensive, and insanitary. The pipes for the heating and plumbing are worn out beyond repair.

The Commissioner's plans provide for two large infirmaries, with day rooms, one for girls and one for boys, inclosed in glass, on the south, with terraces where the children who cannot walk may be wheeled out to sit in the air and

sunshine. In these buildings will be housed all crippled and those unable to care for themselves. The buildings will also be equipped with special bath slabs, upon which crippled children may be bathed comfortably and without danger. A special system of heating will be installed.

Two cottages are also planned for the inmates who are of a higher grade of mental development. A dining and an industrial room will be provided in the basement of these cottages. The dormitories will be flooded with light and air through maximum window spaces on three sides. The construction will conform to the strictest rules of fireproofing. For the nurses, investigators, and teachers a small attractive dormitory will be provided. There will also be a house for the medical staff.

At Sea View Hospital, the problem is entirely different. That hospital was opened in 1913 with a capacity of 1,000 beds. It is composed of unusually costly pavilions, constructed primarily for bed patients, for which the construction cost per bed was nearly \$4,000. The new plans contemplate doubling the capacity of the hospital in order that it may be possible to give immediate care to the large number of tuberculosis patients, many of whom are now obliged to wait for weeks before a vacancy can be found.

The 1,000 additional beds are to be provided in twenty-one open cottages of fireproof construction with forty-eight beds to a cottage. These cottages will furnish accommodations for 400 additional women patients and 600 additional men patients. There will also be a group-building for men, with a dispensary, industrial rooms, billiard and recreation rooms and a general lounging room. There will also be a big dining hall receiving 600 men, which will be so constructed that all the tables can be run out into an adjoining room, and the hall used for entertainments.

The plans for both Randall's Island and Sea View Hospitals have been entirely completed and have been approved by all the necessary official bodies, except the Board of Estimate."

#### EUROPEAN WAR NOTES.

**WORK OF AMERICAN PHYSICIANS IN GERMANY.**—In the issue of the New York *Staats-Zeitung* for July 1 is published an account of the work done by American physicians and surgeons during the past year in war hospitals in Germany and Austria. In 1915, the American Physicians' Expedition Committee organized and opened a large reserve hospital at Oppeln in Silesia and since that time has not only conducted this hospital, but has established and maintained three others in Germany and two in Austria. The article by the Berlin correspondent of the New York paper describes the character of the work done at these institutions in part as follows:

"The American Hospital at Deutsch-Eylau in West Prussia handles all the surgical cases that



come from the front to the Deutsch-Eylau reserve hospital, which has 1,800 beds. It also does all the surgical work for the large garrison. Furthermore, it gets all the surgical cases among the civil population of the town, where there are no more surgeons, as all are at the front; all those from the garrison towns of Reisenburg, Rosenberg, and some other places and those among the civil population of a great many neighboring towns.

"You may easily imagine what a huge amount of work the Americans do there and can willingly believe them when they say that when large fresh convoys of wounded are brought in they have to work night and day in order to complete their tasks. When I was in Deutsch-Eylau recently I saw the official records which show how large was the number of cases in which sick civilians had been turned over to the head doctor of the American hospital with a request for treatment. The rush to the 'Herrn American doctor' on the part of the civil population is so great that it is simply impossible to dispose of all the cases.

"The American Physicians' Expedition Committee has at present, as I am officially informed, six of these large war hospitals in operation, four in Germany (Oppeln, Deutsch-Eylau, Naumburg an der Saale and Coblenz) and two in Austria-Hungary. Two of them are financed by Chicago and one by Milwaukee. I asked the official to tell me plainly if the American doctors really were welcome and if they were needed.

"The American hospitals are filled to the limit," I was told. "So you may see for yourself if we need them and how we trust them. Are they welcome here? We honestly wish that people would send us still more of them. The more the better."

"The equipment of the American hospitals is really ideal. Economy is the order of the day, but considerable sums are spent for instruments and apparatus that are necessary. The orthopedic department of the hospital at Oppeln is the best in the entire province of Silesia, and the things that have been done there already verge on the miraculous. The many wounded men there, whose limbs have been restored to use, will never in their lives forget what they owe to American willingness to aid. Many a one who otherwise would have remained a cripple all his life will be in a position after the war to earn his living as he did before.

"The most friendly relations were soon established between the Americans and the local doctors, as well as the officers of the garrison. The Americans are invited to all the social affairs, and are regular guests at the casino and at the family tables of the best people of the city.

"The people of Germany will not forget the work of the American Physicians' Expedition."

**DEATHS OF BRITISH PHYSICIANS IN THE WAR.**—Report from London states that during the year

from August 1, 1915, to August 1, 1916, over four hundred British physicians died of disease or were killed in action in the war.

**WAR RELIEF FUNDS.**—On September 9 the totals of the principal New England funds for the relief of the European War reached the following amounts:—

Belgian Fund . . . . .	\$151,372.74
French Wounded Fund . .	118,099.25
Serbian Fund . . . . .	102,348.07
Armenian Fund . . . . .	66,594.10
Polish Fund . . . . .	42,669.67
Belgian Tobacco Fund . . .	35,092.50

#### MEXICAN NOTES.

**RED CROSS GERMAN HOSPITAL.**—To finance the complete equipment of an American Red Cross base hospital unit which is being organized by the Military Relief Department of the Red Cross with a staff from the German Hospital in New York, a contribution of \$25,000 has just been given by Mr. Fritz Achelis, 9 East 57th Street, New York City. The Director of this unit will be Dr. Frederick Kammerer, who recently withdrew from active service with the German Army and brings to his new task the valuable knowledge gained at the German front in Europe. The following letter has been forwarded to Mr. Achelis by Maj. Gen. Arthur Murray, U. S. A. (Ret.), Acting Chairman of the Central Committee of the American Red Cross:

"This office has just received information from the Red Cross Chapter in New York that you have donated \$25,000 to purchase the equipment for the base hospital unit which is to be organized in connection with the German Hospital in that city. I desire to thank you for this fine manifestation of patriotism and public spirit in the name of the American Red Cross, which will carry out your humane intentions; and also for the American people, who will benefit by them. It is believed that there can be no more practical and useful way in which the Red Cross spirit of humanity can be put into practical operation than by making such preparations for the care of the wounded in war as to insure our soldiers in future, if the calamity of war should come, against a repetition of the unnecessary suffering and loss of life which has occurred from the lack of such preparations in all our wars heretofore."

**MORBIDITY AMONG UNITED STATES TROOPS.**—Report from Washington, D. C., states that during the week ending Sept. 2, the morbidity rate among regular and national guard troops at the Mexican frontier was 2.5. During this period there were six deaths from disease, of which five were malignant.



**MASSACHUSETTS VOLUNTEER AID FUND.**—On September 9 the total fund of the Massachusetts Volunteer Aid Association for relief of soldiers at the Mexican frontier, and their families, reached the amount of \$75,760.65.

#### BOSTON AND NEW ENGLAND.

**THE WEEK'S DEATH RATE IN BOSTON.**—During the week ending September 9, 1916, there were 232 deaths reported, with a rate of 15.91 per 1,000 population, as compared with 204 and a rate of 14.31 for the corresponding week of last year. There were 53 deaths under 1 year as compared with 51 last year, and 55 deaths over 60 years of age against 53 last year.

During the week the number of cases of principal reportable diseases were: diphtheria, 25; scarlet fever, 13; whooping cough, 18; measles, 10; typhoid fever, 8; tuberculosis, 38.

Included in the above were the following cases of non-residents: diphtheria, 7; scarlet fever, 5; tuberculosis, 1.

Total deaths from these diseases were: diphtheria, 3; tuberculosis, 27; whooping cough, 5.

Included in the above were the following deaths of non-residents: tuberculosis, 4.

**TYPHOID FEVER IN LYNN.**—During the past 3 weeks there has been a small epidemic of typhoid fever in Lynn, Mass. Several cases were reported on August 28, and on September 8, the total number had reached 72. The source of the outbreak has been traced to an infected milk supply.

**PREVENTION OF BLINDNESS IN MASSACHUSETTS.**—In the recently issued report of the Massachusetts Commission for the Blind are given in detail the efforts of the field agent to eliminate eye disablement and blindness caused by syphilis. He states as follows:

"That syphilis was responsible for fully 6 per cent. of our new cases of blindness became evident after a study of eye records dating from a time (1908-09) when methods of diagnosis were much less precise than they are now. A review of a group of 98 cases of practical blindness referred to this Commission during the past year shows that 9 per cent. were diagnosed as syphilitic. This result, while based on too few cases to be conclusive, indicates at least that the earlier estimate was not excessive. Old cases of blindness known to the Commission—especially cases of that prolific cause of blindness, atrophy of the optic nerve—are now, moreover, not infrequently found to be of syphilitic origin. Merely indicative though they are, these facts point to the need of more thorough study. Only on a basis of such investigation can new work for the saving of eyesight from syphilis be planned.

A valuable beginning has been made by Dr. Abner Post and Dr. George S. Derby in an in-

tensive study of congenital syphilis in its relation to that serious and too common eye disease of youth,—interstitial keratitis. This study, promoted by the Commission for the Blind, and financed by the Perkins Kindergarten for the Blind, has already shown in part what can be done to save children's eyes from the more serious effects of this disease. Its continuance through another year may throw some definite light on whether the eye disease, interstitial keratitis, can itself be prevented by early and adequate treatment of its underlying cause,—congenital syphilis.

With the object of securing further knowledge of syphilis, as a basis for preventive work among adults as well as children, the Commission for the Blind voted, Dec. 17, 1914, to make the following suggestions for the consideration of the Commissioner of Health and the Public Health Council: 'That cases of syphilis among inmates of public institutions, such as reformatories, insane asylums, etc., be made reportable direct\* to the State Department of Health, as a first step toward a State-wide study of this cause of blindness and other troubles.' It was the feeling of the Commission for the Blind that this reporting might go hand in hand with work by the State Wassermann Laboratory for the diagnosis of syphilis.

While the proposed action has not yet been taken, the Commissioner of Health has publicly proposed furnishing salvarsan, or some equivalent, free to physicians who report cases of syphilis (as in New York, by office number rather than by name). This action, for which there is a precedent in the furnishing of antitoxin, and of preventive for ophthalmia neonatorum, would be taken less with the idea of securing a permanent cure of each reported case of syphilis, than with the purpose, and reasonable prospect, of checking the contagious stage of the disease, thus destroying many foci of contagion, and limiting the spread of this menace of eyesight, sanity and life itself.

The carrying out of this policy, in connection with the rapidly growing work of the State Wassermann Laboratory, will involve increased appropriations. In this instance, however, even greatly increased expenditure will be a wise investment of the public funds,—an investment certain, in fact, to be many times repaid to the public in the increased earnings—to say no more—of the living, sane and seeing people saved from this infection."

The Commission reports further that during the twelve months ending November 30, 1915, only one new case of total blindness from ophthalmia neonatorum has been discovered in the State. While, of course, there may be other cases not known, it is safe to say that, through the co-operation of the State Department of Health, the local health boards, the Massachusetts Chari-

\* Authority for such action is given by Chapter 670 of the Acts of 1913.



table Eye and Ear Infirmary, the Society for the Prevention of Cruelty to Children and others, the menace from this cause of blindness has been reduced from about 5 to less than 1 per cent. as a factor in bringing about loss of sight.

## Correspondence.

### THIRD NEW ENGLAND TUBERCULOSIS CONFERENCE.

*Mr. Editor:* The National Association for the Study and Prevention of Tuberculosis wishes to issue through you a cordial invitation to the members of your medical society to attend the New England Tuberculosis Conference in New Haven, Conn., on October 12 and 13. One of the most important meetings of this Conference will be the medical session. As a program for this session, we desire to arrange, first, that opportunity shall be given for a full discussion of the experiences of individual physicians and medical associations in dealing with the tuberculosis problem. Secondly, we are planning to have one or two formal papers by leading tuberculosis experts. We expect also to devote several other sessions to discussions of the social aspects of tuberculosis. These will include formal meetings of a popular nature and informal round-table talks.

May we ask that you bring this letter to the attention of your society at its next meeting in order that, if it is their pleasure, delegates may be appointed to attend the Conference and take part in the discussions of the medical session and of the other sessions as well.

Very truly yours,

PHILIP P. JACOBS,

*Assistant Secretary.*

105 EAST 22d ST., NEW YORK CITY, AUG. 1, 1916.

### A CORRECTION.

*Mr. Editor:*—

In your JOURNAL of August 17, there is an excellent article by Dr. John Hitchcock on Tuberculosis Dispensaries. In this article, however, there is one statement which I feel needs correction.

Discussing the incipient case which needs sanatorium treatment, Dr. Hitchcock states that at the Rutland State Sanatorium, which is intended for incipient and favorable cases of pulmonary tuberculosis, there are 50 per cent. of advanced cases which, he says, prevents the sanatorium from doing the work for which it was intended. As a matter of fact, during the past year at the Rutland State Sanatorium, there were 12.8 per cent. of patients classified as "advanced" according to the national classification. It is very likely that Dr. Hitchcock has included in his figure not only those patients classified as "advanced," but also those classified as "moderately advanced."

This is hardly a fair statement, as many of our most favorable patients are in the moderately advanced stages when they commence treatment. In justice to the Rutland State Sanatorium and to the excellent work which it is doing, it seems only fair to make this correction.

Very truly yours,

JOHN B. HAWES, 2d, M.D.

29 Gloucester St., Boston, Aug. 21, 1916.

### A PERUVIAN CUSTOM.

PALEMEIRA, BRAZIL, June 29, 1916.

*Mr. Editor:* I take the liberty to send you this letter with prayer of publishing it in your valuable journal, if you find that it might be of some interest to your readers.

Some years ago, traveling through Peru as a missionary, I had the opportunity of learning the secret process by which the Indians of the Capota River, after cutting off the head of their prisoners of war, reduce it to one-sixth, more or less, of its natural size and keep it as a trophy.

Two of such heads can be seen in the Museum of Natural History in London, England; and probably, in the museums of United States also, can be found some specimen of them.\* They are very small, as I said, but the features of the face are perfectly preserved—they look like miniature heads, and keep incorrupt for an indefinite time.

I would like to know if the divulgation of the process by which such extraordinary result is obtained could be of utility in the field of science; or if there is among the distinguished subscribers of the BOSTON MEDICAL AND SURGICAL JOURNAL anyone who is interested in knowing such process. In that case I would be pleased to communicate to him the operation that has been described to me.

Thanking you in anticipation for your courtesy, I am, Sir,

Respectfully yours,

HORACE GIRALDI.

Address:

Rev. Horace Giraldi,

Rector of the Catholic Church,

Palmeira,

(Rio Grande do Sul, Brazil)

\* There are two specimens in the Warren Museum of the Harvard Medical School, Boston.

## Miscellany.

### CHANGES IN THE MEDICAL CORPS, U. S. NAVY, FOR THE TWO WEEKS ENDING AUGUST 26, 1916.

August 14.

Surgeon J. F. Leys, detached Fleet Surgeon, Atlantic Fleet, to home and wait orders.

Surgeon A. W. Dunbar, to Naval Academy, Annapolis, Md.

Surgeon C. P. Kindelberger, detached Naval Academy, to Fleet Surgeon, Atlantic Fleet.

Surgeon F. C. Cook, to Naval Training Station, Norfolk, Va.

Surgeon C. E. Riggs, detached Naval Training Station, Norfolk, Va., to Navy Yard, Washington, D. C.

Asst. Surgeon A. R. McAllister, detached Navy Station, Guam, to temporary duty, Mare Island, Cal.

Asst. Surgeon W. A. Vogelzang, detached Marine Hospital, to Naval Station, Guam, September 1, 1916.

Asst. Surgeon Lincoln Humphreys, to Naval Hospital, Washington.

August 21.

Asst. Surgeon O. J. Mink, detached Naval Hospital, Puget Sound, Washington, to home and wait orders.

Asst. Surgeon J. E. Neplerger, M. R. C., to Marine Barracks, Port Royal, S. C., September 1, 1916.

### APPOINTMENTS.

The following Mason Unsett's place, to which he was appointed on August 21 as assistant surgeon of the United States Medical Reserve Corps, at Washington, D. C., Boardman, Dr. George S. Doble, Dr. Walter A. Johnson, Dr. Roger French, Dr. Nathaniel R. Moore, and Dr. James F. Stoddard.



## UNITED STATES CIVIL SERVICE EXAMINATION.

MEDICAL INTERNE, ST. ELIZABETHS HOSPITAL, OCTOBER 4, 1916.—The United States Civil Service Commission announces an open competitive examination for medical interne, for both men and women, on October 4, 1916. From the register of eligibles resulting from this examination certification will be made to fill vacancies in this position in St. Elizabeths Hospital (formerly Government Hospital for the Insane), Washington, D. C., at \$900 a year, with maintenance; and vacancies as they may occur in positions requiring similar qualifications, unless it is found to be in the interest of the service to fill any vacancy by re-instatement, transfer, or promotion.

The positions are tenable for one year, and pay \$75 a month and maintenance. During the year, however, a postgraduate course in mental and neurological diagnostic methods is given, an examination is held, and promotions to the next grade, junior assistant physician, are made. Beyond this there is regular advancement for men whose services are satisfactory. St. Elizabeths Hospital has over 3,000 patients and about 800 employees to care for. In addition to the general medical practice offered, the scientific opportunities in neurology and psychiatry are unsurpassed.

Applicants must show that they are graduates of a reputable medical college or that they are senior students in such an institution and expect to graduate within six months from the date of this examination. The names of senior students will not be certified for appointment in the event they attain eligibility in the examination, until they have furnished proof of actual graduation. Applicants must not have graduated previous to the year 1914 unless they have been continuously engaged in hospital, laboratory, or research work along the lines of neurology or psychiatry since graduation, which fact must be specifically shown in the application. Applicants must be unmarried. Age, 20 years, or over, on the date of the examination. No sample questions of this examination will be furnished. Applicants must submit to the examiner, on the day of the examination, their photographs, taken within two years, securely pasted in the space provided on the admission cards sent them after their applications are filed. Tintypes or proofs will not be accepted. This examination is open to all citizens of the United States who meet the requirements.

Persons who meet the requirements and desire this examination should at once apply for Form 1372, stating the title of the examination for which the form is desired, to the United States Civil Service Commission, Washington, D. C. Applications should be properly executed, excluding the medical and county officer's certificates, and filed with the Commission at Washington in time to arrange for the examination at the place selected by the applicant. The exact title of the examination, as given at the head of this announcement, should be stated in the application form.

## NOTICE.

## MEMORANDUM IN RELATION TO THE PROPOSED "CLINIC FOR PAYING PATIENTS," TO BE CONDUCTED BY THE MOUNT SINAI HOSPITAL IN COLLABORATION WITH A GROUP OF SPECIALISTS.

The clinic is proposed in the belief that there exists in this city a need for pay clinics where ambulant patients in moderate circumstances, who are not entitled to free treatment, may consult reliable specialists without being compelled to pay office fees which are beyond their means. The clinic does not wish to compete with or to supplant the family practitioner, but aims to afford treatment to patients who are now

neglected, to undermine quackery, and to replace free dispensary treatment by compensated, or at least partly compensated cooperative practice. It is the purpose of the clinic to confine its aid to persons having incomes of \$1200 per annum or less.

(Incidental to the inauguration of clinics in certain special branches of medicine and surgery, it is proposed to undertake the organization of a department for the prevention of disease. The method to be followed in this department will be that of the periodic examination of individuals for the early detection of morbid tendencies, with a view to the prevention or postponement of constitutional disorders.)

Patients will be admitted to the clinic on week days from 7.30 to 9.00 P.M. There will be a registrar whose duty it will be to receive applicants, to reject persons not eligible for treatment, to keep the social, clinical and financial records of the clinic, and to collect and account for all fees. Mount Sinai Hospital contributes the use of its Dispensary Building and equipment. All earnings in excess of necessary expenditures will be divided among the members of the medical staff in proportion to their hours of attendance. The standard fee for routine or office consultation (except in the Department for the Prevention of Disease) will be one dollar. Medicine will not be furnished by the clinic; prescriptions given to patients are to be filled elsewhere as in ordinary private practice. A moderate extra charge will be made for x-ray work, and for any unusual laboratory or other investigation which necessitates the use of costly supplies, or the collaboration of auxiliary workers. The clinic will not seek to derive any profit from such investigation or examination, but only to be reimbursed for any unusual outlay, and to make suitable payment to professional collaborators.

Besides treating patients who come to the clinic of their own accord, or who may be referred by physicians for routine examination and treatment, the members of the staff will be prepared to see patients at the clinic in consultation with general practitioners. It is presumed that cases presented in this way will be such as require unusually careful and complete examinations: the fees to be charged for this consultation work will, therefore, be higher than the regular fee of one dollar to be charged for routine examinations, and may be agreed upon between the practitioner presenting the case and the clinic physician consulted; such special fees should ordinarily be two or three dollars.

## SOCIETY NOTICE.

NEW ENGLAND SURGICAL SOCIETY.—The annual meeting will be held in Boston on October 5, 6, and 7, 1916.—P. E. TRUESDALE, M.D., *Secretary*.

## NOTICE OF MEETING.

On September 20 will be held at Hotel Bancroft, Worcester, a meeting of 5 delegates from each Massachusetts District Medical Society to consider what action may be taken towards securing repeal or amendment of the Workmen's Compensation Act.

## RECENT DEATH.

DR. EARL C. PECK, of Newton, Mass., who died of acute poliomyelitis of bulbar type on September 5 at Philadelphia, was a native of Newton. He received the degree of M.D. from Jefferson Medical College in 1914, and later became resident physician at the Germantown Hospital. In 1916 he was appointed first assistant resident physician of the Philadelphia Municipal Hospital, and was serving in that position at the time of his death.



# The Boston Medical and Surgical Journal

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### Original Articles.

#### THE RAT AND INFANTILE PARALYSIS: A THEORY.

BY MARK W. RICHARDSON, M.D., BOSTON.

FROM 1909 to 1914, I was Secretary of the Massachusetts State Board of Health and was, therefore, intimately concerned in the investigations made during those years in relation to the occurrence in that State of infantile paralysis. Begun in 1907, at the instigation of Dr. Robert W. Lovett, a member of the Board, and continued intensively for a period of five years under his supervision, together with the expert coöperation of Professors Milton J. Rosenau and Theobald Smith, the work of the Massachusetts health authorities represented an activity equalled only by the investigations carried on over a similar or longer period of time in Sweden. Because of their expert character, the Massachusetts investigations have received world-wide acknowledgment for the manner in which they were conducted and for the conclusions drawn from them.

At the International Congress of Hygiene, held at Washington in 1912, it was my privilege to present for the Board the results of the Massachusetts experience for the previous five years, in which presentation I maintained that epidemiological observations in Massachusetts did not bear out the general assumption that the disease was a contagious one in the ordinary sense, in that it was conveyed by direct or indirect personal contact through the secretions of the mouth and nose. Professor Rosenau, furthermore, present-

ed experimental evidence to show that in monkeys, the infection could be transferred through the bite of the stable fly, *Stomoxys calcitrans*, an observation later confirmed by Anderson and Frost. These views, however, were combated by Professor Petterson, representing the Swedish Government, who presented an elaborate brochure defending the thesis that the bodily secretions and excretions are important factors in the distribution of infantile paralysis and that direct and indirect human contact are the determining influences in the spread of the disease.

Unfortunately for the insect and fly theory of transfer, experiments made by a number of observers in the years following 1912 failed to confirm the results of Rosenau and of Anderson and Frost, so that medical opinion has gradually accepted the claims of the Swedish observers that personal contact is the essential element in the spread of the infection. This conclusion is hardly to be wondered at, in view of the fact that the virus of the disease can be demonstrated not only in the secretions and excretions of the sick individual, but also oftentimes in the nasal secretions of healthy persons who have been in association with patients. Then, too, the insect theory, especially as related to the stable fly, did not harmonize with the undoubted fact that it was enter epidemics, though rare, had been reported.

In spite, however, of these contradictory observations, I have never been seriously moved from my opinion that infantile paralysis is not transferred from person to person by direct or indirect contact, but that, in some manner, insects play an important rôle in the epidemiology of this disease.



The arguments in support of my position, I shall present in two categories: first, those arguments which militate against the transfer of infection by direct or indirect human contact, and, secondly, those which support the theory that the disease is transmitted by rats or other rodents, by insects on the rats or rodents, or by both in combination.

*Facts Against its Transfer by Direct or Indirect Human Contact.*

1. Nature of the virus: The virus of infantile paralysis resembles markedly that of rabies, essentially an animal disease. It is not in any way similar to that of tuberculosis, influenza, pneumonia, diphtheria, septic sore throat, all of which so-called sputum diseases are known to be spread through personal contact, and the infected secretions of the mouth and nose. The virus of rabies is widely disseminated through the body and is present in the saliva, and yet, the disease is not transferred from individual to individual except through the agency of a punctured wound. The mere presence, therefore, of the virus of infantile paralysis in secretions and excretions constitutes no proof that these body-products are of importance in the spread of the disease, especially when the great majority of other epidemiological factors are shown to be against such agency.

2. Summer incidence of the disease: The vast majority of cases occur during the spring, summer, and fall, when personal contact is least intimate. With the onset of winter, when the population becomes more and more congested in houses, schools, etc., the disease becomes reduced almost to nothing, whereas most of the above-mentioned sputum diseases occur chiefly in the winter time when congestion of the population is at its maximum.

3. Maximum prevalence of the disease in country districts where personal contact is least intimate at all times.

4. Failure to spread in general hospitals for children in which, up to recent times, cases have been received without let or hindrance.

5. Failure to spread in schools and institutions for children in which single cases have occurred and where personal contact with large numbers of children has been intimate.

6. Extreme rarity of the disease in doctors, nurses, and other attendants upon persons sick with infantile paralysis.

7. Entire absence of infection in laboratory workers with the virus of infantile paralysis. Of course, in these two latter instances, the effect of age is important, but occasional infection would certainly be noted if the disease were markedly contagious.

8. Comparatively rare occurrence of more than one case of the disease in large families of children even under the markedly congested conditions of tenement life.

9. Epidemics cease oftentimes in mid-career, so to speak, when the human material has been

by no means exhausted and the opportunities for direct or indirect contact are at their maximum.

10. Long continued immunity of cities and towns in close commercial relations with infected centres even though interchange of population with possibilities of indirect contact is marked. The city of Springfield, for instance, although in intimate commercial relations with the infected Berkshire district in 1907 and the infected Colrain district in 1908, had practically no cases of infantile paralysis until the epidemic of 1910. A similar situation is noted by Wernstedt, who says, concerning the epidemic of 1911 in Sweden: "It is to a certain degree surprising that in the three counties nearest Stockholm and the county of Stockholm no epidemic occurrence of infantile paralysis can be traced until the epidemic had been raging in Stockholm for several months. In regard to the county of Upsala (next to Stockholm) the epidemic had already raged in Stockholm for two months before the first case of the epidemic was observed in this county, this case being, at the same time, the first observed here during that year." A similar experience was noted in Great Barrington in 1909, where a small but marked epidemic occurred first in September, October, and November, even though immediately adjacent towns of Berkshire County were afflicted during June, July, and August.

11. The Colrain epidemic in 1908 was perhaps the most severe on record, thirteen per thousand of the population being affected, yet according to Emerson, who investigated the epidemic in this and neighboring towns, evidence of contagion was practically lacking.

12. The disease has been noted by many observers to travel radially from centres of infection, and it is very common to find the later cases on the outskirts of the infected area. If third persons or indirect contact were responsible for the spread of the disease, we should expect to have an irregular distribution and to find early as well as late cases on the periphery.

13. Finally must be explained the very important fact that given areas once severely infected are commonly immune for a considerable period of years in spite of the fact that new generations are constantly being born and new susceptible material is being brought in from non-infected neighborhoods. Swedish observers, for instance, have pointed out, in comparing the two great Swedish epidemics of 1905 and 1911, the fact that although the affected districts in 1911 are contiguous to the districts affected in 1905 and have, therefore, apparently some important relation to the older epidemic, the older areas were, in 1911, practically free from the disease even though the newer areas were affected to a maximum extent. The conclusion is, therefore, necessarily to be drawn that the epidemic in 1911 had some intimate connection with that of 1905 though the relation is not clear. In



order to explain the immunity of the old areas, the Swedish investigators have put forward the theory that in 1905 the disease was very much more prevalent than was recognized, so much so in fact that, through the agency of missed and abortive cases, the community in some way not only became immune itself, but, in some unrecognized manner, communicated that immunity to the new-born generations. It is, of course, apparent that this theory is a very far-fetched one. Conceivably such a conclusion might be drawn if there had been in 1905 a severe infection of adults. Children born in the interval between 1905 and 1911 might thus perhaps inherit an immunity, but adults, as a rule, are not susceptible to the disease. This point will be taken up again in a succeeding statement and a theory much more in accordance with the facts will be submitted.

*Facts Supporting the Theory that the Disease is Transferred by Rodents, Insects, or Both.*

Summer incidence of the disease: That poliomyelitis occurs at its maximum in the summer months is a fact which the supporters of human transmission cannot get away from, and one which they, as a rule, glide over with insufficient comment. The resemblance, furthermore, of the disease in its epidemiology to malaria and yellow fever has been noted more than once. Moreover, the positive results of Rosenau and also of Anderson and Frost, together with the successful experiment of Flexner with the bed-bug, made it highly probable that insects might, in some instances at least, be instrumental in the transfer of the disease. In this connection, indeed, a few positive experiences by observers of the first class are sufficient to counterbalance in their evidential value many negative results. That the bed-bug might be the intermediate link in the chain seemed to me highly improbable in view of the fact that infantile paralysis attacks with almost equal frequency all strata of society. In considering, furthermore, the possible agency of the stable fly, it has always been difficult for me and others to explain the undoubted, though rare, occurrence of winter epidemics. Thus, by a sort of elimination, one is brought to a consideration of another epidemic disease, plague, which is known to be transferred, for the great part, through the agency of the rat and the flea, and to be most prevalent during the warmer seasons.

The possible relation of the rat to infantile paralysis was first brought to my attention in 1910 through an observation made by Dr. Charles E. Simpson, State Inspector of Health. In investigating an epidemic of the disease, Dr. Simpson observed the fact that many rats, whose homes had been in a town dump, were compelled, because of a fire in that dump, to seek refuge in the neighboring houses. In these houses infantile paralysis seemed to be mildly prevalent. Another experience pointing in the same direction occurred in a small country neighborhood occu-

pied as a summer colony by a number of city residents. The only immediate unusual factor to be assigned for this epidemic was the removal, from one situation to another, of an old barn. The barn cellar was dug up and improved, and, during this operation, the affected children played in the excavation. The inference is, of course, that many old rat holes were destroyed and that the accumulation of years in the way of rat disease and fleas may have been distributed broadcast to the outside world. A third observation, but a rare one, was made in a Massachusetts city where, in an infected district, many rats were said to have been found dead. In another city a muddy river and its tributaries honeycombed to a greater or less extent the municipality. The location of the cases of infantile paralysis seemed to have a remarkable relation to this stream and its branches. Indeed, the whole Massachusetts experience seems to indicate that the disease has been endemic along its rivers, most of which are polluted by sewage to a greater or less extent. The possible association of the water rat was thus indicated.

If, now, we take the rat and its parasite, the flea, as the hypothetical agents in the transmission of infantile paralysis, how does this assumption fit the epidemiological facts?

1. The rat has a world-wide distribution.
2. It is found in habitations of all classes of the community, rich as well as poor.
3. In the winter time the rat keeps largely to its hole, coming forth in the spring with the advent of warm weather and the growth of appropriate food.
4. Although statistics are unavailable, it seems highly probable that rats are more common in the country, at least in proportion to the population, than they are in the city. In any event, it is not unreasonable to suppose that in ordinary country barns, out-houses, etc., the exposure to rat influence is much more marked than it is in the city where the houses are better built and where sewage and other sanitary provisions are much more complete. In any event, the children are constantly in the barns and numerous cats and dogs might convey infected fleas to the houses. Incidentally, the cats and dogs might become infected. This increased exposure to rat influence might, moreover, explain the higher percentage of adult infection in rural districts, noted by Frost.
5. The great increase in poliomyelitis during the last twenty-five years has been explained as due to the great increase in facility of transportation all over the world, so that infinitely increased human contact has become possible. The same argument would apply, however, to the transfer of infected rats from one locality to another. Indeed such transfer in freight cars and ships carrying grain, cattle, pigs, etc., must be common. This brings us to another consideration



6. That the relation to the railroads of cases of infantile paralysis has been noticed by a number of observers. Nothing could be more probable than that children living near railroads should play in rat-infected freight cars. Infected rats, furthermore, if dropped from freight cars, would necessarily seek their food in the immediate neighborhood. A possible case in point was that of a young college student who contracted infantile paralysis during his summer occupation as a freight brakeman.

7. In the study of the epidemiology of infantile paralysis, it has been a common observation that (a) the disease occurs in foci, (b) in general, the cases spread more or less radially from centres of infection, and (c) the intensity of infection rises in one neighborhood while it is decreasing in a focus in its immediate vicinity. Such a fact is hard to explain through human transmission, which should result in the irregular distribution of cases, but is perfectly consonant with a gradually spreading infection of rodents. The migratory habits of the rat are well known. In New Orleans, Creel found that marked rats set free at a certain point in the city could be trapped considerable distances away in a very short time. Indeed, migrations of large numbers of rats over long distances are on record. The rat would, therefore, satisfactorily explain the spread of infantile paralysis from one part of a city to another, from one town to another, or from one country to another. In this connection, the following theoretical point may be of importance. In a number of instances, it has been noticed that before the beginning of an epidemic, a single case of infantile paralysis has occurred in the early months of the year, perhaps in March or April. The real epidemic, however, has not made its appearance until May or June. In other words, there seems to be a distinct period of latency or incubation, the need of which is hard to determine in view of the fact that abundant susceptible human material is close at hand. The period between generations of rats is approximately three months, and this fact may have some relative bearing: a new generation of young rats possibly being necessary to the further propagation of the disease. Or, perhaps, the virus must undergo a cycle of development in the flea. In this connection may be cited the experiments of Rosenau, who was able to convey to young rabbits the infection of infantile paralysis. The suggestion, therefore, may be pertinent that young rats, like young human beings and young rabbits, are much more susceptible to the disease than adult rats and that in a given epidemic focus, no further progress will be possible until a new generation of young rats has been born. Herein, moreover, may lie the explanation of the fact that epidemics often show two points of maximum intensity a month or two apart.

(NOTE.—Dr. Rosenau tells me that he has been able recently to produce paralytic disease

in rats by inoculation with the virus of infantile paralysis. The experimental data are, however, not sufficiently advanced to justify conclusions.)

8. It has been noted above that districts severely affected by infantile paralysis are rarely affected again for a considerable period of time and that the Swedish observers have attempted to explain this fact by the assumed occurrence of a far-reaching immunization of the general human population. I have already pointed out that such a theory would be tenable only if adults were markedly subject to the disease. I believe, however, that such a local geographical immunization might well be possible through extensive infection affecting primarily not the human but the rodent population. With the immunization of the rats, the human epidemic must necessarily cease. Whether such an immunity exists and can be transferred from adult rodent to offspring must be determined by experiment.

9. In the transfer of the infection from the rat to man, the agency of the flea is assumed, although the possible contamination of food by rodent excretions might well be considered. The insect transfer might be simply mechanical or it might require a preliminary cycle of development of the virus in the flea. Furthermore, the possible rôle of cats, dogs, and other animals, or even human beings, as carriers of infected fleas, would be apparent. Moreover, in grossly unsanitary surroundings, the fleas might carry infection from one child to another directly.

The foregoing theoretical considerations have been put forward as explaining better than any other hypothesis as yet submitted, the epidemiological facts as observed in infantile paralysis.

The human contact theory cannot be made to fit these facts except by efforts so extraordinary that the value of the theory is thereby practically destroyed.

That many and extended experimental investigations will be necessary in order to determine the validity of the rodent theory goes without saying.

Our present knowledge shows the rat to be an enormous burden to mankind from the point of view of both economies and health. If it shall be shown that infantile paralysis is due in any way to the rat, no further argument will be required for world-wide efforts towards the destruction of these vermin.

## SOME MEDICAL ASPECTS OF THE WORKMEN'S COMPENSATION ACT.\*

By FRANCIS D. DONOGHUE, M.D., BOSTON.

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WHEN the Workmen's Compensation Act went into effect in July, 1912, the relation of the

\* Abstract of remarks at the meeting of the Berkshire District Medical Society, June 29, 1916.



medical profession to the treatment of accident cases was considerably changed. The law which went into effect in regard to medical services is as follows:

"During the first two weeks after the injury, the association shall furnish reasonable medical and hospital services, and medicines when they are needed."

The theory of this law was that the insurance companies, who represented the employers of labor, would provide the best kind of treatment, because of the fact that if good treatment was not provided, the period of disability would be prolonged. It is this provision which has made a large part of the so-called dissatisfaction of the medical profession with the Industrial Accident Board, but it is only fair to point out that this is the law of the Commonwealth and is not a rule or regulation of the Industrial Accident Board. Efforts to amend this law and give the injured man the right to name his own doctor, have been made at each session of the Legislature, but without success, and in a recent decision of the Supreme Court, the right of the insurance company to provide treatment is upheld if it offers reasonable and adequate treatment, the only question upon which the Accident Board is called upon to pass. The man is bound to accept it unless he is willing to pay for his own treatment.

The Industrial Accident Board, from the beginning, have been in favor of liberal treatment of the medical profession and a liberal interpretation of the law, so that the man would not only have good treatment but, as far as possible, have the kind of treatment with which he would be best satisfied. To aid in carrying out the law and to try and obtain from the medical profession its support, a largely attended meeting was held at the State House on March 26, 1913, presided over by the Honorable James B. Carroll, the first chairman of the Board, who has since been honored by elevation to the Superior Court and then to the Supreme Bench. The result of that meeting was published by the Accident Board in pamphlet form, Bulletin No. 4, and widely circulated.

Acting upon the advice of the medical profession, the Industrial Accident Board called upon the Massachusetts Medical Society and the Massachusetts Homeopathic Medical Society, each to delegate two members who would serve as members of a committee in conjunction with three men to be appointed by the Board, to pass upon the medical problems from the standpoint of the physician. The result of the meeting of that committee, whose recommendations are contained in Bulletin No. 6, have been followed by the Industrial Accident Board. The recommendations, which are the basis of the decisions made by the Board up to the present time, read as follows:

"Fourth.—That insurance companies be requested to provide suitable blanks for notifica-

tions as well as specifications of services rendered by physicians.

Fifth.—That industrial insurance companies be encouraged to allow all reputable physicians to render services in industrial accidents, provided they are willing to render such services upon reasonable basis.

Sixth.—That the Accident Board should make arrangements with which the insurance companies should cooperate; that any physician whose bill is in dispute may appear before a representative of the Accident Board within a reasonable distance of his home.

Seventh.—That the Accident Board shall provide for medical referees by districts.

Eighth.—That fees paid by the companies should not be less than the average minimum fee in the locality in which the service is rendered.

Ninth.—That charges up to \$50 for major operations are not excessive.

Tenth.—That physicians appearing at hearings before the Board shall receive the compensation as provided for under Section 8, Part III, of the act. (By a subsequent vote of the medical advisory committee this should not apply to the impartial examiners named by the Board.)

Eleventh.—That services rendered by lodge physicians be paid for, provided it is not inconsistent with the rules of the order.

Twelfth.—That specialists, established and recognized by the profession as such, may receive special rates for their work, provided the case requires special skill.

Thirteenth.—That the ruling previously made by the Accident Board, that 'fees should not be charged an injured party whose employer was insured larger than the injured party would be charged were he not insured,' should be interpreted to mean that in a given accident the fee paid by the insurance companies for services should not be less than the average minimum fee for similar services in the locality in which said services are rendered."

In spite of the fact that the law permits insuring companies to provide treatment, the large number of companies permit a free choice of physicians as long as bills are rendered upon what the Industrial Accident Board has termed "an industrial basis." It is evident that both a free choice of physicians, and the payment of all the medical rights of the man to the hands of the insuring company, have elements of weakness which lead to dissatisfaction. The two weeks' period for medical services, worked fairly well, but as there are now risks of 10 months a year that go beyond that period, risks of 10 months were found it would treatment was needed 10 weeks or months after the injury. The Industrial Accident Board passed on to the Legislature of 1913 as follows:



"The Industrial Accident Board requests that the Legislature give the Board the power to require the payment of bills for medical and surgical treatment, medicine, medical and surgical supplies, crutches and apparatus when necessary, beyond the first two weeks after the injury, in unusual cases where the injury is so serious as to require and warrant such additional medical treatment."

Based upon this request, the Legislature passed a law which went into effect on October 1, 1914, amending the law so that the law reads as follows:

"During the first two weeks after the injury, and, if the employee is not immediately incapacitated thereby from earning full wages, then from the time of such incapacity, and in unusual cases, in the discretion of the board, for a longer period, the association shall furnish reasonable medical and hospital services, and medicines when they are needed. Where, in a case of emergency, or for other justifiable cause, a physician other than the one provided by the association is called in to treat the injured employee, the reasonable cost of his services shall be paid by the association, subject to the approval of the Industrial Accident Board. Such approval shall be granted only if the Board finds that there was such justifiable cause and that the charge for the services is reasonable."

Since October 1, 1914, the Board has the right in unusual cases to approve the payment of medical services beyond or after the first two weeks. The unusual feature of each case under the law must be considered and passed upon by the Industrial Accident Board before a doctor is able to collect for services after the first two weeks. The Board, however, has interpreted this, as in all other problems connected with the treatment of an injured man, in a liberal spirit; but for the protection of the doctor and of the patient, application should be made and the insurance company notified before the 14th day when it appears that the case is one that is going beyond the two weeks' period.

The insurance companies in hospital cases where the hospitals have met them half way, have also been liberal, and one type of case, namely, the fractures of the long bone, the fractures of the spine, in which hospital treatment beyond the first two weeks is necessary, have largely been cared for without question. The Board, in addition to taking into account the seriousness of the nature of the injury and the cost of hospital and medical services, takes into account other surroundings of the patient, such as whether or not there are dependents for whom compensation money must be used, and if used for dependents, would leave little for medical care. In other words, the amount of compensation paid and the demands made upon the compensation are both factors which should be represented to the Accident Board when applications are made for medical treatment.

Under the first law, the doctor had no individual standing in regard to the collection of his bill. He could not ask for a hearing and his rights to collect were so merged with the rights of the injured employee, that unless the injured employee asked for a hearing upon the doctor's bill, there was no way for the doctor to get a hearing. The Industrial Accident Board petitioned the Legislature that this be remedied. The Legislature passed a law which went into effect on June 25, 1914, amending the law so that the law reads as follows: (Section 13, Part III.)

"Fees of attorneys and physicians, and charges of hospitals for services under this act, shall be subject to the approval of the Industrial Accident Board. If the association and any physician or hospital, or the employee and any attorney, fail to reach an agreement as to the amount to be paid for such services, either party may notify the Board, which may thereupon call for the formation of a committee of arbitration, in accordance with the provisions of this act, and all proceedings thereunder shall be in accordance with the provisions of this act."

The Workmen's Compensation Act has, as a fundamental, the insurance of the wage-earning capacity of the worker and not the insurance of the employer against lawsuits. If the law is approached with this idea in mind, it would at once appear that the restoration of function, if accidents cannot be prevented, is of almost paramount importance. Restoration of the worker means prompt and adequate care that dangers to life may be minimized, that long disabilities be prevented, and that when healing processes are complete, there shall be treatment and training given so that the injured may use, to the best advantage, the mutilated or disabled part which results from his industrial injury.

Among other things in the interpretation of the law, the Board has interpreted, as medical services, dentistry; but dentistry, when needed, should only be provided after consultation either with the insurance company or the Board. Eye-glasses have been considered necessary for the restoration of men to work; artificial eyes have been provided and, by agreement with the companies, artificial limbs also.

The old method of determining the rights of an injured man, based upon his one day in court, under the Workmen's Compensation Act, is greatly changed. Opinion evidence, therefore, as to diagnosis and prognosis, does not have the same relation to the rights of the man that it does in ordinary court procedure.

In the first place, it is necessary to determine if the injury arises out of and in consequence of the employment. That settled, the next important thing is to give such treatment as will restore the injured employee to his former wage-



earning condition. In the hearings before the Board, there is not the effort to settle the case at one hearing, that always is made in a court of law, but he is entitled to observation under competent medical observers acting impartially for the Board, and over a sufficient period of time, so as to insure proper consideration of the injured man's rights from all standpoints.

The wage earner of the Commonwealth is one of our greatest assets and the loss of time of any trained workman is a loss not only to himself, but a loss to the community. One of the first results of the Workmen's Compensation law, aside from the applied Christianity which is involved, is the fact that the workmen receive adequate care in the form of medical services, but what may be more important, a study is made to prevent the occurrence of accidents; and prevention is undoubtedly better than compensation.

A large part of the criticism of the Industrial Accident Board from the medical profession has come, I think, from not understanding what the Accident Board can do and what the Accident Board cannot do. The Industrial Accident Board is created by a law which carefully defines its powers, and it also defines certain procedures which the Industrial Accident Board is bound to follow. Just as the Workmen's Compensation law altered materially the relation between employer and employee, so it altered the relation of the medical profession to injured employees. It also altered the relation of the lawyer and his client, if the client was an employee insured under the Act. To pass upon the rights of the employer represented by one of the many insuring companies, the employee, the hospital or the doctor who cared for the employee, the lawyer who looked after his interests, are a part of the duties of the Industrial Accident Board.

There is a considerable misunderstanding about the functions of the medical adviser of the Industrial Accident Board and he is criticized for many things about which he knows nothing and for which he is in no way responsible. If you will pardon me,—because this is rather personal,—I would like to say that under the law the medical adviser is adviser to the Industrial Accident Board on such matters as they ask his opinion. His opinion is not taken as a substitute for other testimony given at hearings, unless he appears in the case and testifies under oath. For that reason, medical testimony given by the attending physicians, or others called in cases, should be given with as much thought and care as if given in any other court, because the committee of arbitration under the law has no other evidence on which to make findings and it is only on review or appeal to the full Board that other evidence may be introduced. The medical opinion on a given case is important if properly considered, but it

does not supplant testimony in regard to facts which are presented by other witnesses.

The law is not perfect; it is in process of change, but it has, as a fundamental, the proper conservation of the wage earner and offers a great field for medical study, medical investigation and constructive medical care.

To carry out the law, the Industrial Accident Board must depend upon the medical profession both for proper treatment and to see that the attention of the injured workman is properly called to his medical rights when the right depends upon some fact of which only the medical profession would have proper knowledge. It must depend upon the profession for certificates regarding the condition of men, and must rely upon their testimony in arriving at just conclusions. There is a great obligation on the profession to aid in carrying out this most humanitarian act.

## THE WEASEL IN MEDICINE.

MR. PHILLIP HALE has recently called attention to the description given in Edward Topsel's "History of Four-Footed Beasts and Serpents" (London, 1658) of the medicinal uses that were made of the weasel in the spacious Elizabethan days and thereafter, as late as the Restoration. The following is the remedy recommended for gout:

"Take a little young whelp alive, well fattened, and a living Weasel in nine pints of Oyl, and unto the same two or three pounds of butter and boyl them together until the beasts be made lank or lither, and then put your hands or feet a whole day in hot Oyl well strained." It would be easier, continues Mr. Hale, to put weasel powder in wine; this would also be efficacious in epilepsy, the headache, and in case you were bitten by a scorpion; also for palsy or shaking of the joints; "very effectual for the expelling or taking away of the pain and welo of the eyes"; it helps all sores and impostumes. Some recommend the brains of a eam I mingled with those of a weasel. If an ox or horse is stung or bitten, stroke the wounded place with a weasel skin. If you are bitten by a weasel, apply onions and garlic externally, or a sweet wine.

"Two remedies should here be given. The powder of a weasel being mingled with the blood of a young swallow cured the rabies or spinnzie. The same is also very effectual for the expelling of wens or cancers in the body. The same diseases are cured by a decoction of wine, to burn a young weasel, cut together in earthen pot, and to mingle with the powder thereof Honey, Turpentine and Butter, and a sufficient quantity of oil, and the same may be



Ointment to apply it unto the bodies of the grieved parties."

"There is a speedy remedy for the driving away of rheum in the head, and the Catarrh swelling by rheum in the jawes, which is this: To take a Weasel upon a Thursday in the old Moon, and put him alive in an unburned pot, that in the Boyling he may be torn, and dried into powder, which powder being gathered together and well tempered with Honey, to give it to the diseased person every day in a spoon fasting, to the quantity of three drams, and it will in short space wonderfully ease him."

"These remedies, Mr. Hale pertinently observes, were prescribed by the wisest ancients. They were soberly advised in 1658. What will men and women of 2158 say to the treatments and prescriptions of 1916?"



## THE MAJOR DIVISIONS OF MENTAL HYGIENE—PUBLIC, SOCIAL, INDIVIDUAL.\*

By E. E. SOUTHAARD, M.D., BOSTON.

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I TOOK occasion in preparation for this discussion to jot down a number of points which I might desire to make concerning mental hygiene. To my astonishment, I shortly found that I had written out no less than seventy-nine headings. These I shall forbear to present to you in their fulness, and hope that the chairman will call me to order when the fatigue point of the audience is reached.

It is unlikely that there should be seventy-nine main divisions in mental hygiene. The classical situation with numerous sciences and arts is that they shall divide up into three or perhaps into five divisions. As a fact, I found very many of the considerations in mental hygiene may be grouped under three headings. There is a *mental hygiene of a public or governmental nature*; there is a *mental hygiene of a social nature*; and there is the far more familiar and well-known *mental hygiene which considers the individual* as such. Dean Pound of the Harvard Law School has divided legal interests into public, social, and individual, and I feel that his legal distinction pretty well holds in mental hygiene.

If we run through the great group of admissions at a hospital like the Psychopathic Hospital (which this year, 1915, has admitted no less than 2000 patients), we shall find that a certain large proportion of the cases are routine cases,

whose public, social, and individual features are obvious and clear, immediately suggesting an appropriate disposition and appropriate measures of treatment. These *routine* cases may not all be successfully treated from the standpoint of the individual; but from the standpoint of society and the public authorities, they can be successfully handled on the basis of familiar and well-understood rules of government, society, and medicine. But over against these routine cases, we find a minority of cases of a more difficult nature, which I may call the *intensive* group. The physicians among you will call to mind at once cases of mental complications in pregnancy, cases of brain syphilis requiring special treatment, and the like. It is true that these cases form an important subgroup among the intensive cases and require expert examinations and special devices in treatment. But aside from these intensive medical cases, we find once more that the public, social, and the individual grouping, which I have just mentioned, is further exemplified. For instance, we find a small but perturbing group of (a) public service cases. In this group, we have to deal with cases of family dispute with respect to will making and the like. Again we have to deal with superior court cases given to us for medical examination and decision. Again the police courts and the juvenile courts give us cases of such a special nature that they belong in the intensive group. The Industrial Accident Board and the Immigration Service, to say nothing of the schools, furnish their quota.

Besides the public service group, there is what may be called (b) a social service group of cases, in which legal problems are not prominent, but in which economic and domestic, and other environmental difficulties predominate. Again, we have a great number of (c) individual cases which are neither intensively medical nor of particular importance to the public authorities from the standpoint of community welfare, nor again of particular social importance or open to social service management for their cure or amelioration.

This brief characterization will serve to indicate some of the main divisions of mental hygiene as they develop, from a review of cases actually flowing into such an institution as the Psychopathic Hospital. You are, doubtless, all aware how different in its scope and effect the Psychopathic Hospital is from the ordinary hospitals for the committed insane. Our cases are a group that in former years would never have reached the hospitals for the insane, at least in any such quantity. So much I would say to a lay audience by way of emphasizing the fact that the task of mental hygiene is not merely that of improving the outlook of the given individual. From Feuchterleben's work on the "hygiene of the soul," to date, it is true that mental hygiene has developed from an interest in the individual, and I for one am not disposed

\* Read before the Conference of the Massachusetts Society for Mental Hygiene, Ford Hall, Boston, Nov. 17, 1915.



to regard this, in some sense, narrow view of the function of mental hygiene, as at all unfortunate. Many of the most effective workers in the mental hygiene movement have started from an entirely individual interest in the problem, seeking the way out at first by endeavors to legislate improvement into the situation, and later by the slower process of moulding public and social opinion. But to deal with mental hygiene in any of its phases means that we are carried directly from the problems of the individual to problems of society, and if life favors us with a little power, our interests pass from the less definitely social range to that more definitely crystallized portion of society's efforts known as government. In short, no one interested in the mental hygiene of the individual but finds himself forthwith launched upon one of the most stimulating of all social uplift movements, leading directly to efforts to establish in the framework of government a variety of measures for the mentally sick and defective.

The laity and the medical profession need no warning about the value of individuality in every human being. We do find, however—I speak possibly as a somewhat prejudiced physician—that the legal profession and the courts fall prey to a certain formulating tendency in which the interest of the individual gets lost or obscured. One of our problems in mental hygiene is to force the necessity of individualization of diagnosis and treatment upon the legal profession and the courts. I do not refer merely to the lack of individual handling of criminals and alleged criminals, although the situation here obviously enough calls for a revamping of the legal point of view. You will all have read or gotten some inkling of the work of Healy on the Individual Delinquent. As a medical man, I was struck with the vehemence and insistence of Healy's claim for individualization in the classification and handling of delinquents. Medical men and thoughtful laymen do not perhaps need to be brought to look upon what they regard as so obvious a matter, namely, that each human being, whether or not alleged to be a criminal, requires individualized management. If we look into the criminological world, however, we shall find that the lawyers and the judges, and perhaps even some probation officers, need to go a good way before they will arrive at what medical men would regard as a proper individualization of their material. This is doubtless why Dr. Healy, fresh from his rich experience on the border line between medicine and law, should have thought fit to devote a large work like *The Individual Delinquent* to the necessity of individualization in the handling of medical aspects of delinquents.

I said awhile since that individualized handling of mental situations by the lawyers and the judges should not be confined to criminals and alleged criminals. It is our task to demonstrate to the lawyers and the judges that the concept

insanity itself is a somewhat artificial unit; that in point of fact, every insane person is really the victim of a particular form of mental disease. Kraepelin remarks that one should hesitate to classify a person as insane unless one can put him in a particular disease group. It is a question how far any but the most enlightened judges and lawyers understand the nature of the point I am endeavoring to make. The crystallized form of social service which we call court procedure or a system of jurisprudence is from its very nature liable to overformulation. The rock upon which social progress is founded is consideration for the individual. We must convince our servants in that more crystallized, not to say fossilized, regions of social service called public service, in the first place, that it is not government they are serving, but society; and that in the end, it is not even society which is so important as its individual constituents,—men and women.

The social workers of the audience will be inclined at this point to pick a quarrel with me, for they are aware that physicians are by no means always ready to take that kind of interest in the individual as such as is ingrained in the hearts of social workers. The social workers find that we physicians are more interested in *parts* of individuals than in the individuals themselves. They respect our analyses and want our diagnoses; but between the analytical physicians, on the one hand, and the overformulating governmental representatives on the other, the social workers find a heavy task. Administrators tell me that social workers often strive to break the law gently for the purpose of helping individuals. Physicians tell me, on the other hand, that social workers may easily have too much confidence in the ability of money and vacations to solve medical problems. The social worker is, in a sense, the marrow of the present situation. I believe that a prominent practical sociologist has questioned whether social work at this time is a profession. If not, social work is at any rate a sort of cement substance or intermediary body between all the various agencies which I have mentioned, to say nothing of the hospitals and relief agencies. Social workers carry the decision of the physician to the lawyer, the decision of the lawyer to the physician, and the decisions of both to the family. They may even be found explaining these decisions to the patient himself, sometimes a doubtful expedient in the case of psychopathic persons, and they carry the news from the individual to his family, from the family to the judge, to the probation officer, to the physician, and to the public administrator or administrator.

The major disservice that is being done to society from the present aspect of the individualization of social, and as a corollary, the individualization of the public branch of mental hygiene, is the placing of the hands of the lawyers and the judges upon the



ministrators, upon whose experience judicial decisions and statutory provisions will gradually develop the power of society over the psychopath and his family, not only in the interest of society and the family, but also in the interest of the patient himself. The non-public, or more broadly *social branch* of mental hygiene is still in an unfinished and developmental state owing to the doubt which prevails whether social service is as yet a profession. Until it becomes such, doubtless no great amount of leverage can be got for improvement of the social situation on behalf either of the psychopath or of his fellows. In point of fact, evolution in the past has tended in some countries to make public duty out of every well demonstrated social need. Social workers should not be sorry if their tasks are removed from them as soon as they begin to be successfully performed. As for the *individual branch* of mental hygiene, there has been, as is well known, a great increase of interest in the individual as an individual, derived largely from French, and later German, efforts in psychopathology. The analytical pathologist who sees his subject segregated into a lot of interesting items is being replaced with a more synthetic type of physician who sees the individual as such. Curiously enough, one of the most striking signs of this development is in a movement called psychoanalysis. The leaders of this movement are far less analytic in one sense than the routine examiners whom they wish to replace. The psychoanalysts are almost from the beginning of their labors synthetic. They put two and two together almost at the outset of their examinations and constantly see the individual as such. Whatever be the truth as to psychoanalysis, it is certain that the movement itself is but one symptom of the wave of individualization which is passing through a great many sciences and arts.

I might say much concerning the technique of mental hygiene. I might insist upon the value of getting a large and increasing number of persons to resort voluntarily to public institutions for examination; or endeavor, in the words of one critic, to make mental disease in a sense fashionable, as it has been claimed nervous prostration is fashionable. Parenthetically, it is of course true that nervous prostration is in a great many cases a mild, or even relatively severe, psychosis, and is merely termed nervous to escape the suggestions of the term "mental."

I might insist also upon the importance of stimulating the temporary care of cases not subject to court review and thus acclaim the modern tendency to take mental cases under medical care much as ordinary medical cases are taken.

I might further enlarge upon a division of the tasks of mental hygiene into a task of prophylaxis and a task of after-care; but for this time does not now permit, and all these important matters of voluntary and temporary care

admissions, of the prophylactic and after-care divisions of mental hygiene, have been or will be sufficiently brought before the audiences of this conference. Other features of the general situation, such as the great value of work with alcoholics and the salvage process as applied even to apparently hopeless victims of delirium tremens, should obtain a hearing in any proper presentation of the subject of mental hygiene. The new syphilis programme dependent upon an increasing number of important medical observations and discoveries in the past few years, is also worthy of special attention. Into these things I shall not at present go, and I shall consider my task sufficiently well executed if I can go home satisfied that my contentions about individualized classification, diagnosis, treatment, and management of all cases, whether or not they belong to the medical man chiefly, to the social worker, or to the public authority, are deemed worthy.

#### WHAT RECENT INVESTIGATIONS HAVE SHOWN TO BE THE RELATION BETWEEN MENTAL DEFECT AND CRIME.\*

BY A. WARREN STEARNS, M.D., BOSTON.

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ALTHOUGH the word "defect" appears in the title announced for my paper, and thus would seem to limit the scope of my remarks, I think it best to consider in my discussion not alone the relationship of mental defect to crime, but the relationship of mental disease in general to crime.

When one looks over the literature of the last few years about crime and about mental disease, it is surprising to see how well understood the relationship between crime and mental disease appears to have been for some time. It is also surprising, or at least it leads one to wonder, why so little has been done. Recent investigations have only proven apparently what we have known for a long time. The chances are—perhaps more formerly than now, but even now—that of all persons going to hospitals for the insane, anti-social or asocial conduct is a factor in a large majority. It is either anti-social conduct or fear of the possibility of such that leads most people to consider the state hospital. It is also a fact, I think, that every person who is called a criminal is now thought to have some mental variation from the normal. That variation may be slight, of course, but while it seems only too obvious, it is necessary to insist upon some attention being paid to this relation.

\* Read at the Conference of the Massachusetts Society for Mental Hygiene, Ford Hall, Boston, Nov. 18, 1915.



To-night I want to sum up what has already been demonstrated under our very eyes here in Massachusetts. At the recent Conference of Charities in Pittsfield, there was some comment about the fact that the Massachusetts man takes Massachusetts as all-sufficient. I do not confine my remarks to Massachusetts in any such belief. I merely do it to show that under our very eyes enough has been done to warrant active steps being taken to correct an apparent neglect. I shall run briefly over the work of several persons, and having thus boldly asserted that there is a marked relation between mental disease and crime, I shall attempt to prove it by citing Massachusetts, and, for that reason, familiar authorities.

The first name which one strikes in considering this topic—the first work, at least—is that of Dr. Walter E. Fernald,<sup>1</sup> of Waverley. Dr. Fernald tells me that when he first started talking upon the relation of crime and mental disease, a newspaper editorial said that he had been looking at imbeciles for so many years that he saw them wherever he looked. At any rate, Dr. Fernald has been in a position to study the question and to demonstrate the relationship between the two social problems. He also first called attention to the fact that the criminal man described by Lombroso was none other than our imbecile boy.

The next work which has impressed me as being especially important is that of Dr. Henry R. Stedman,<sup>2</sup> who has been a pioneer in getting helpful legislation. Massachusetts has had some very wise laws for many years; laws by which any judge has authority to ascertain the mental condition of any prisoner; laws by which the judge has the authority to commit such a prisoner to a hospital for observation. Massachusetts was a pioneer in this direction, but unfortunately these laws have not been used as much as one would like.<sup>3</sup> Of seven or eight hundred patients at the Hospital for Criminal Insane at Bridgewater, only about one-seventh were sent there by operation of these laws. The other six-sevenths were sent there because these laws were *not* used and a roundabout method had to be employed.

Some years ago the Concord Reformatory recognized the need of expert advice, and employed Dr. Guy Fernald<sup>4</sup> as their prison physician. The conservative, concise reports which he has made from time to time of conditions there, when one considers the almost opposite reports which we have had from other sources, giving percentages of from 1 to 100%, are most welcome. It is refreshing to find a man who has consistently kept his eye to the ordinary, and given sensible results which everyone could grasp. Dr. Fernald, in his latest papers, states that 15% of the boys at Concord should be segregated because of their mental condition.

Somewhat later, under the stimulating influence of Mrs. Jessie D. Hodder at Sherborn, Dr.

Edith R. Spaulding began a similar work dealing with another sex, and in a way another class of dependents. She reports that 24% of the reformatory population should be segregated because of their mental condition, and that nearly half of the population show some degree of mental defect.

Next, and quite recently, Judge Bolster at the Central Court has succeeded in employing Dr. Victor V. Anderson<sup>5</sup> to make a beginning there. Dr. Anderson has not had an opportunity to get sweeping statistics, but in his first report, 30% of 100 sent him for examination were found to be feeble-minded, which shows that they are there, as elsewhere.

Still more recently, the Massachusetts State Board of Insanity has conducted three investigations looking toward the segregation of those now in the wrong institutions.

The first of these dealt with the class called "defective delinquents." It demonstrated that in our state hospital population, there is a considerable number—mostly girls—who are not definitely insane, not definitely feeble-minded, but whose conduct it is difficult to control. Their advice was that there should be a separate department or institution for such dependents.

The next investigation dealt with the population of the Bridgewater State Farm. That showed several things. In the first place it showed that obvious cases of insanity were being sentenced as criminals. It showed that the long drawn out examinations which one thinks of as mental examinations would not have been necessary in at least one-third of those cases. The ordinary judge or probation officer should have had training enough to have recognized in at least one-third of those cases that the trouble was mental disease or defect.

The last investigation of the Board of Insanity dealt with the population at the State Prison at Charlestown,<sup>6</sup> and as far as that has gone it also establishes the relation between mental disease and crime. Nearly one-fourth of those examined showed a considerable degree of mental defect. In each year's admissions, of 125 to 175, 15 to 20 are transferred from Charlestown to Bridgewater, as insane.

Having thus established the relationship between crime and mental disease, one might well ask what is to be done about it. There are about 176,000 arrests in Massachusetts a year. Obviously it would not be possible to do everything that can be done by way of arresting each of that number. It would take hundreds of physicians and require months of work. And it would not be practicable at present. My belief is that the first mental examinations should be made by probation officers, judges at police officers. If that were an advance to be made, or feeble-minded, or even mildly insane, we would weed out of our criminal class a step which has been taken with regard to mental defect. A change in statistics is important. I believe that



cite cases at a meeting of this sort, and I think I had better not do it; I will simply say that numerous cases have come under observation where, following 10, 12 or 15 years of hospital residence, insane persons have been within a few days after their escape sentenced as vagrants. Known inmates of the school for the feeble-minded have been arrested, their defect ignored, and sentences imposed.

I think that there is some responsibility which is not being fulfilled by our courts in picking out these known insane and feeble-minded. I think that an examination several hours long is not feasible or necessary. I think that a good history of the life, brief and easy to get from every man arrested, obtained before sentence, would in the majority of cases enable a non-medical man to separate out most of the insane and feeble-minded. In other words, rather than a new law, there is needed a better understanding and working out of those already in existence.

I think we need to focus our attention upon these facts, which are now very well known, and instill the spirit of investigation rather than that of precedent into the courts. I believe that responsibility as well as power is at present in the courts.

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## EPILEPSY.\*

By EVERETT FLOOD, M.D.,

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A DEFINITION of epilepsy is difficult. The root meaning of the word conveys very little idea of the condition, but it has come to have the applied meaning which seems to be all that is necessary. If a person has a fit of any degree,

mild or severe, frequent or infrequent, and this fit is repeated even a few times at intervals, we say that the person is epileptic; but it ought to be understood that epilepsy is not a disease. It is a symptom, or a collection of symptoms, of quite a variety of conditions.

It is probable that among the people of civilized countries there may be found at least three persons in every thousand who permanently have recognized attacks of epilepsy. It is also true that a very large number never come to light, and that the person afflicted goes on through life with real epilepsy but is never counted among the epileptic class. In the whole community, about one child in twelve has some sort of a fit in early life. A few have them repeated, and yet nearly all fail to become epileptic. Mothers are not worried as to the future when the baby has a fit.

The problems connected with the institutional care of epileptics are very much the same problems as those connected with the care of the feeble-minded and insane. In 500 cases of feeble-minded, 11% are epileptic. This 11% are essentially like the balance that do not have fits. They do not even rapidly go down hill mentally during a long series of years. Those epileptics who do become come from the classes not so primarily feeble-minded.

Of the institutional cases which come to autopsy, 78% show gross brain lesions. Probably nearly all the other cases show microscopic lesions. There is no way of knowing whether there are actual lesions in the cases of those who as a rule do not come to institutional care, and this class is very much larger than the class that does come to institution care.

A person who is afflicted with epilepsy may be engaged in any occupation, but if his attacks recur many times, he is sure to lose his position; and I doubt if there is often a case where the epileptic symptom is at all prominent without some manifestation in conduct which is different from the absolutely normal.

Of institution cases, 184 epileptic children were examined with great care. Fifty-three per cent. of these were distinctly feeble-minded; 44% were on the road to dementia; 2% only were without very positive mental symptoms. Among 1033 cases, including the 184 young persons cited above, 631 are feeble-minded, 377 insane, and 25 normal. All the normal but two are among the children.

In a group of 221 cases, 30% presented active mental symptoms such as mania, delusions, and hallucinations. This agrees somewhat with the 44% who finally become.

When we find that so many of the cases in which epilepsy occurs are among those who are defective, it is natural to assign this enfeebled mental condition as in some way a cause of their epilepsy. How this occurs in a few of the feeble-minded, and in a majority does not, I think would be impossible to say. We may as-

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sume that there is some inherited tendency which produces this epileptic symptom, and this seems to be as far as we can venture.

A large number of cases of epilepsy have an inheritance of either feeble-mindedness, epilepsy, migraine, alcohol, or insanity.

A certain number of cases of epilepsy are of course caused by injuries to the head, and some follow such conditions as scarlet fever and measles, but it seems almost necessary in these cases to assume a predisposing cause, as an immense number of head injuries and scarlet fever attacks are not followed by epilepsy.

If parents can know the tendency to epilepsy, or the liability of a certain condition coming about, they can care for their children, provided they have the proper intelligence and suitable surroundings, and so guard the child in the way of wholesomeness of living, diet, self-restraint, etc., as to tide them over the critical periods of childhood to maturity without their manifesting this symptom. This has apparently been done in many cases, and parents should certainly be taught how to take care of children who are especially liable. After the fit has once occurred, the matter is one of difficulty: if it occurs at intervals for quite a number of times, then it is one of extreme difficulty. However, even then it is not hopeless in all cases and very much can be done in the way of home care, which is superior to institutional care, if properly conducted. When it comes to be a question of isolation for the prevention of sex difficulties, of course, the comparison between home and institutional care is on a different footing.



## IDIOSYNCRASY TO COW'S MILK; ITS RELATION TO ANAPHYLAXIS.\*

By FRITZ B. TALBOT, M.D., BOSTON.

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THE condition described as an idiosyncrasy to cow's milk may manifest itself with some or all of the following symptoms: When an infant is given cow's milk, even in small amounts, it vomits almost immediately. This may be followed by mild or severe diarrhea, high fever, or more commonly, a subnormal temperature, weak pulse, and other symptoms of shock. In a few cases convulsions, spasm of the glottis<sup>1</sup> or an urticarial rash has been noted. These symptoms may occur when cow's milk has been given for the first time, or after the second or third bottle, especially if breast milk has been given between the bottles. The pronounced idiosyncrasy to cow's milk, which is the subject of this communication, is relatively rare.<sup>2</sup>

It has been shown that the gastro-intestinal wall of the newborn infant is permeable to a foreign protein,<sup>3</sup> and that soon after birth an infant develops the power of destroying the foreign protein, digesting it in such a manner that when it reaches the blood stream, the foreign element is absent. This may be brought about in two ways:

1. By digesting the protein down to amino acids, and during the process of digestion, removing the foreign element from it, or
2. By developing antibodies, which will destroy the foreign element in the protein as it passes through the intestinal wall.

Certain individuals, whose parents and close relatives give a history of such anaphylactic phenomena as asthma, hay fever, chronic urticaria, or idiosyncrasies to foods, have a hereditary predisposition to sensitization. Hyashi<sup>4</sup> attempted to determine the tolerance of twenty-eight normal infants for egg albumen, and found that infants with the "exudative diathesis," or those who had recently recovered from acute disturbances of digestion, had a lower tolerance for egg than normal infants.

After the body has developed its protective functions, injury to the intestinal mucous membrane is necessary for the foreign protein to pass unchanged through the intestinal wall directly into the blood. Such injury may accompany acute indigestion, infectious diarrhea, or any mechanical injury to the intestinal mucous membrane. Moro<sup>5</sup> has shown that a small proportion of babies (two out of twenty-one), with disturbances of digestion, had precipitins to cow casein, in their serum. Lust,<sup>6</sup> Hahn,<sup>7</sup> and Modigliani and Benini<sup>8</sup> brought forward further evidence for the permeability of the intestinal mucous membrane to foreign protein, and obtained a larger proportion of positive results than Moro. Many experiments on animals have shown that it is possible to sensitize animals to foreign proteins through the digestive canal.<sup>9</sup> Sensitization can be brought about by feeding either raw or boiled milk. It is more difficult to sensitize guinea pigs with milk boiled fifteen minutes, and they cannot be sensitized by milk which is inactivated by passage through a Berkefeld filter.<sup>10</sup>

It is necessary in certain instances to specify the doses of the foreign protein as to sensitivity and not immunize the individual. Just as when a laboratory animal has its dose of foreign protein given to it at stated intervals during the process of sensitization, so must the foreign protein in the case of the baby, even when he is given to the infant. The first time when a baby was given a bottle of cow's milk and once in ten days. In other instances the first cow's milk, and all subsequent bottles, were given to the baby, and in some instances, in which case we must assume that the sensitization was hereditary and present at birth.

\* Read before the New England Pediatric Society, April 25, 1916.



If, on the other hand, cow's milk is given daily, a natural immunity ought to develop, just as it does in the laboratory animal. The work of Schloss<sup>11</sup> and Berger<sup>12</sup> gives very suggestive evidence by differential counts of the white cells in the blood, in favor of this view.

The following cases are examples of idiosyncrasy to cow's milk:

CASE 1. D. T. A healthy baby which had always been breast-fed until he was eight and a half months old, when he was given one bottle consisting of whole milk, six ounces, and barley water, two ounces, because the mother's milk was giving out. This was not given again until three weeks later, because the baby had a middle ear. After he had recovered, whole milk, seven ounces, and barley water, one ounce, was tried and refused by the baby. It was, therefore, spooned into him, and he vomited it almost immediately. Whole milk was then omitted and whey tried, with the same result. One week later one ounce of a mixture consisting of whole milk three ounces, cane sugar three level teaspoonsful and boiled water five ounces, was vomited. He was then given the breast and cereal gruel only, and did well for one week, at the end of which time one ounce of milk was put into eight ounces of cereal gruel, and a teaspoon of this mixture given. The baby "shuddered when he swallowed it," vomited shortly afterwards, and within an hour his body was covered with an urticarial eruption. It was then certain that he had an idiosyncrasy to cow's milk. (The shuddering is a characteristic symptom in these cases.) The milk of a goat was then obtained, and was taken without any symptoms or further trouble. Six months later, November, 1914, cow's milk was given to him without any ill effects, and he has been taking it ever since.

CASE 2. A. P. A girl of 17 months of age, with the following history: She was the first child of healthy parents, born at full term, Caesarean section, weighing five pounds at birth. Her mother was unable to nurse her, and during the first eight weeks of life she was given modifications of cow's milk, most of which were vomited. She lost weight, had undigested stools, and did not sleep as a normal baby should. At nine weeks of age she was put on a wet nurse and has had breast milk ever since. At six different times, attempts were made to wean her and she was given cow's milk in various ways, as condensed milk, whey, and in all sorts of modifications, but in every instance the milk was vomited, and the baby became very ill. She was limp, pale and cold with profound shock. These attacks were never associated with urticaria. Once when Mellin's food and milk were given, the baby "almost died." The physical examination showed a pale, poorly developed and nourished baby, weighing 15½ pounds. Aside from a general lack of development, the physical examination was normal. Scarification skin tests were done with the following materials—fresh cow's milk and dried cow casein, the protein of barley and potato,<sup>13</sup> all of which gave slight positive reactions. These positive reactions were narrow, elevated, urticarial wheals, surrounded by a slight reddening, while the control scarification, and that to which egg was

applied, showed no reddening or elevation, and were, therefore, negative. The baby was then given goat's milk which it took without any symptoms, and was entirely weaned in two weeks' time. The mother reported one and a half months later that the baby was doing well and gaining in every way on the goat's milk.

Since the skin test to cow casein and fresh cow's milk was positive, this was a case of anaphylaxis to cow's milk. When goat's milk was given in these two cases it did not cause any symptoms. This was because the anaphylactic element in the food was not due to the milk itself, but to the cow in the protein of the milk. Mare's milk, probably, would have done equally well since it was the milk of another species. The writer does not claim any originality in the use of goat's milk in these cases, since Barbier<sup>14</sup> used it in 1910. He feels, nevertheless, that it has a definite indication for use, and that it should be used in all cases of idiosyncrasy to cow's milk.

#### CONCLUSIONS.

1. Foreign proteins may pass through the intestinal wall of infants shortly after birth, and in later infancy, when the mucous membranes are injured.
2. Idiosyncrasy to cow's milk is an anaphylactic phenomenon and can be demonstrated, at least in some instances, by a specific skin test.
3. The treatment consists in giving the infant milk from another species of animal, preferably that of the goat.<sup>15</sup>

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- <sup>19</sup> Since this paper was written, an excellent article by Schloss and Worthen (*Am. Jour. Dis. Children*, 1916, xi, p. 342) has been published and adds much information to the subject.



## Therapeutic and Preventive Medicine.

### TREATMENT OF TUBERCULOSIS IN INFANCY.\*

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THE diagnosis of chronic or acute tuberculosis was made in 12% of 600 consecutive medical cases under two years of age admitted to the Infants' Hospital after March, 1914. The admitting diagnoses were pyelitis, obscure fever, anemia from various causes, chronic indigestion from fat or overfeeding, bronchitis, acute indigestion with fermentation, infectious diarrhea, tuberculous meningitis; and a few were admitted for observation. Tuberculosis had not been recognized in any of the cases except the acute ones with meningitis.

I think the general impression is that tuberculosis in infancy, though a preventable disease, is hopeless, incurable, and not to be permanently helped by treatment. I think this impression and failure to recognize the disease come largely from a difference in opinion as to what constitutes tuberculosis in infancy, and before discussing the treatment it will be necessary to define clearly what is meant by the term tuberculosis in infancy.

We often hear the question debated as to what constitutes tuberculosis in infancy, but I cannot see what difference it makes whether it is infantile or adult tuberculosis. What constitutes tuberculosis is infection with the bacillus of tuberculosis, and when infection takes place, there results a pathological process whose nature has led to all the discussion as to whether an infant has a disease of tuberculosis, or is merely infected with tuberculosis. It is very dangerous to try to make such a distinction, for if the bacilli have gained entrance into an individual, they have set up a process which is permanent, which in infancy gives symptoms and is kept active enough to have living bacilli in it, and is a constant menace to health. Another dangerous expression, fortunately little used now, is "pretubercular stage," a sort of threatened-with-tuberculosis idea—as if there could be a disease with symptoms in any way connected to that disease before infection with the contagium of that disease had taken place.

I think it is now pretty generally accepted that tuberculosis is similar to syphilis and leprosy in that it is a disease with a primary lesion. The bacilli gain entrance through the tonsil, lung, intestine, skin or wherever the portal of entry may be. There may or may not be a permanent lesion at the portal of entry, but the lymph glands draining the entrance point become inflamed and enlarged. If the portal of

entry is in the lung, the primary lesion is usually demonstrable in the lung tissue as a grayish nodule in size from the head of a pin to a split pea, with the glands at the hilus of the lung on that side much enlarged. The primary focus is not always found in other localities. This constitutes the primary lesion, the primary focus and the enlarged glands; the primary focus may not be found, but the glands remain chronically inflamed with living bacilli in them. It is the primary lesion with its glands which is referred to when it is said that an infant is infected with tuberculosis, but has not the disease of tuberculosis. What is meant, however, is that the infant has none of the signs in his lungs or anywhere else which have long been taught to be the signs of tuberculosis. This condition is diagnosed at the Infants' Hospital as chronic tuberculosis to distinguish it from all other forms of tuberculosis resulting from secondary changes in the primary lesion, or from reinfection from without. These secondary changes result from extension by contiguity from the primary lesion, from breaking down of the primary glands and discharge of bacilli into the lymph or blood streams, or into the digestive tract by sputum. Secondary forms may also result from repeated reinfection from without. These secondary forms are diagnosed as acute tuberculosis, hence we have the primary glandular tuberculosis as chronic tuberculosis and the secondary forms as acute tuberculosis.

Now after this hasty summary as to what tuberculosis in infancy means, I think we may consider the treatment. If as tuberculosis in infancy, only those cases are recognized as such which give physical signs and symptoms of the secondary forms, that is, tuberculous meningitis, tuberculous bronchopneumonia, peritonitis, and so on, then there is little or nothing to be said about treatment, for there is nothing to be done except to make the baby comfortable. They all die, except a rare case of tuberculous bronchopneumonia or peritonitis. However, all secondary cases should have as near absolute quiet as possible, sufficient food but not to overtax the digestion, and fresh air but not necessarily cold air, in order to save every bit of energy, hoping that the disease may be arrested.

The first step in the treatment of infantile tuberculosis is to be willing to accept the primary lesion and all that it means, and to forget the term infected with tuberculosis as indicating the disease of tuberculosis. The fact that a primary lesion does not have symptoms is referred directly to the location of the lesion involved. When local symptoms are present there is more than a primary lesion, for there is a harsh, brassy, or rattling cough, or enlarged lymphatic glands are found, or there are infectious and breaking down of the lymphatic glands, or tuberculosis due to reinfection from the primary focus. The fact that there is no primary lesion cannot be proved.

\* Read before the New England Pediatric Society, Apr. 25, 1916.



trition, anemia, failure to gain, or loss in weight in spite of good feeding, indigestion; and it seems to me that these early cases have a marked intolerance for fat, so that if in a case of chronic indigestion from fat the history does not give a previous carbohydrate injury, I am suspicious of tuberculosis.

If a primary lesion can be kept as such the infant is safe, hence the treatment is to recognize the primary lesion, prevent secondary changes in it and extension from it, and to prevent reinfection from without.

The recognition of the primary lesion takes us into the realm of physical examination, but it is important enough to speak of it here under treatment. The primary lesion from its nature is represented by a localized mass of lymph glands, because the primary focus or entrance point cannot be demonstrated during life. This mass of glands is easily seen and felt in exposed places, as the neck, axilla, or groins; palpable in the abdomen as mesenteric glands; made out in the chest by auscultation and percussion, and confirmed by x-ray. The Pirquet test is reliable, if obtained, and is corroborative evidence; but one test may not be sufficient, and it may be necessary to raise the susceptibility by a subcutaneous injection of tuberculin. A mass of mesenteric or bronchial glands and a positive Pirquet without enlarged glands elsewhere, means definitely a primary lesion. Bronchial glands without a recent acute respiratory infection in an infant, not doing well, even in spite of a negative Pirquet, I should consider tuberculous till proven otherwise by the disappearance of the glands, or by repeated Pirquets and general improvement. Two cases will serve to illustrate these points:

A boy 26 months of age was brought to me because he was thin, pale, underweight and not gaining; poor appetite, distended abdomen, undigested stools, too tired to play.

Examination showed a long, thin, pale infant. Lungs clear. D'Espine at the fourth dorsal, spinal dullness corresponding, interseapular dullness. Pirquet positive. Abdomen moderately distended. Nothing abnormal made out. Stools marked excess of soap. No x-ray taken. This was a case of primary tuberculosis of the bronchial glands with the entry in the lungs.

The treatment was rest, diet low in fats with broths, green vegetables and cereals, fresh air day and night, out doors when weather permitted. The rest prescribed was twelve hours at night, as much in the day as he was willing to take and not to be encouraged to play. He gained a pound and a half the first month and showed marked general improvement. Though the mother had been told that it would take a long time to bring about permanent improvement, the boy was so much better at the end of two months that she broke rules. He stopped gaining, lost his appetite, and was peevish. With no other change but enforced rest he again improved rapidly, and when last seen after a year and a half was doing well.

A girl, 18 months, brought to me for indigestion, anemia, large abdomen.

Examination showed a thin, pale infant, nervous and precocious. Chest negative, no signs of bronchial glands. Abdomen much distended so that nothing definite was felt, tympanitic throughout. Stools large and soapy. With regulation of diet, rest, and enemas, the distention was relieved so that I could palpate a mass of large mesenteric glands. The milk supply was so questionable that with the findings I made the diagnosis of primary tuberculosis of the mesenteric glands with the entry in the intestine.

The treatment consisted mainly in rest. With moderate quiet there was no gain in the symptoms. At 20 months she was put to bed and kept flat, restraint used when necessary. At 22 months the weather permitted her to stay out night and day, and she stayed out for a year. She was unhappy even in midwinter if taken in the house for more than feeding and bathing. The gain was slow. After ten months' quiet she was allowed freedom on a large bed in the house for one hour daily but not allowed to walk. Several attempts had been made to give more freedom, each time with return of peevishness and indigestion. At the end of a year she was digesting well, gaining color, glands palpable but half the size. The temperature never went above 101° and whenever even a slight fever there was accompanying indigestion and bad stools. Now at four years is doing well and has just recovered from pertussis.

The object of treatment in these cases is to get the infants in such good physical condition that they can fight against any disturbing element absorbed from the primary glands, and to give the primary glands a chance to be walled off and become inactive, for they are never healed. There are three factors essential in the treatment—rest, fresh air and sunlight, suitable food. Rest, I think, is far ahead the most important, and I mean by rest inactivity sufficient to get gain in digestion and weight. Though this stage is called chronic glandular tuberculosis, it is a fairly active process, and active tuberculosis demands rest. If later lung or bone tuberculosis needs rest, it is just as reasonable and necessary to give it at this stage. It may seem at first thought that enforced rest might be difficult to maintain and might not be good for the infant, but if one has ever treated tuberculosis of the spine he will know of children on bed frames for months and remain in good general condition. The little girl mentioned was very happy, and it was necessary to pin her down only when she began to feel well. She did not ask to walk, and talked of the time when she would be well enough to be up and walk like other children. It is not necessary to fasten these cases to bed frames. A stout sheet, with holes for the head and arms, can be pinned to the bed, and affords sufficient restraint. The rest should be persisted in till long after the symptoms have been relieved, and then resumed gradually, according to conditions.

The infant with a primary lesion should be protected from diseases affecting the region



drained by the primary glands, because the new infection will wake up the tuberculosis, the glands will break down, and there will be discharge of bacilli into the lymph or blood stream, with the resulting secondary forms. Tuberculosis following measles or pertussis is the result of waking up a pre-existent primary bronchial gland tuberculosis by the new infection draining into the glands. Acute miliary tuberculosis may follow acute intestinal diseases by inflaming mesenteric glands which are already tuberculous. However, an infant with primary mesenteric tuberculosis may have pertussis without any unusual concern. Hence it is important to caution parents to be more than ordinarily careful not to expose infants with a primary lesion to contagious diseases or to any other infection.

The treatment of tuberculosis in infancy comes essentially to treatment of the primary lesion and the maintenance of it as such. The important factors in the treatment are suitable food, fresh air, and rest sufficient and persisted in long enough to insure good nutrition and gain in weight. As long as the tuberculosis is kept primary, the infant is safe, and unless tuberculosis is recognized earlier than the secondary forms, little or nothing can be done in treatment.



### Address.

#### THE PORTRAITS OF FLORENCE NIGHTINGALE.

By MAUDE E. SEYMOUR ABBOTT, B.A., M.D.

*McGill University, Montreal.*

(Continued from page 367.)

#### III. THE PERIOD OF THE CRIMEAN WAR. (OCTOBER, 1854, TO AUGUST, 1856.)

PLATE VII.)

This portrait,\* one of the best known of the earlier pictures of Miss Nightingale, shows her, in garb and visage of the pre-Crimean days, seated on what is evidently a portico at Scutari, overlooking the Straits towards Constantinople. "I have not been out of the Hospital yet," she wrote, ten days after her arrival, "but

the most beautiful view in all the world lies, I believe, outside my door."

As will be remembered, the Crimean War was waged between Russia and Turkey, with Great Britain and France ranged as allies on the latter side. The battlefield was the Crimean peninsula on the northeastern border of the Black Sea, and the bloodshed was so great as to almost parallel the horrors of today. The British public accepted with resignation the news of the sacrifices in the field. But it met in a different spirit the alarming reports that followed immediately upon the news of the Battle of Alma, fought on September 20, 1854, of the ravages which neglect and disease were making among the multitude of the wounded, under the complete lack of sanitation that prevailed among the British troops. Not only were the hospital supplies, that had been freely sent out, unavailable for use through misunderstandings with the Turkish customs and other stupidities, so that the men were unclothed and unfed, and all sanitary measures neglected, but there was an entire lack of proper attendance for the sick, the skilled female nurses employed by their French allies providing an invidious comparison. A letter to the *Times* from its correspondent, William Howard Russell, exposing these defects in no measured terms, and calling upon England for redress, evoked a storm of indignation that swept the country. Miss Nightingale's training and personality were well known to a large circle of influential friends, and, moreover, her excellent administration of the "Governments Home" had brought her into touch with another side of the philanthropic public. The letter to the *Times* appeared on October 12. On October 14, under the action of a small committee, headed by Lady Maria Forester, she wrote to her friend Lord Sydney Herbert, who was then Minister at War, asking for authority to go out at her own expense at the head of a small band of five nurses. It is one of the coincidences of history that her letter to Lord Herbert crossed one from him to her, asking her, in the name of the British War Office, to undertake this task, and urging for acceptance of it on the ground that she was the only person in England who could make it a success, and promising for individual authority over the "Female military nursing establishments in the East" and for medical supplies. On October 21, five days after the matter was formally settled, she sailed for the East, and the

\* See JOURNAL, page 414.





PLATE VII. FLORENCE NIGHTINGALE AT SCUTARI.

From an Allen print of a drawing by Wandesforde, engraved by W. Wellstood.



head of thirty-eight nurses, of whom twenty-four belonged to the Roman Catholic and Anglican sisterhoods and the remainder were untrained. During these five days of selection of candidates and all the mass of detail involved in the organization of such an expedition, as also in all the exigencies of the uncomfortable voyage out, the most noteworthy thing about Miss Nightingale was her absolute calm, and her quiet control of the situation.

The groups of military hospitals in the East bore to each other something of the relationship that the field and base hospitals of our forces do now. On the Crimean peninsula, in the immediate neighborhood of the conflict and amongst the adjacent hills, there were, in addition to the regimental dressing-stations, four large general hospitals, some established in huts, others in buildings. On the opposite, that is, the southwestern, side of the Black Sea, across the Bosphorus from Constantinople and overlooking the Sea of Marmora, were the three great British military hospitals of Scutari, two of which, the General and Barrack Hospitals, were under the jurisdiction of Miss Nightingale, as also were all the hospitals in the Crimea, and for a time those at Koulali, four miles distant from Scutari. It was to the great Barrack Hospital of Scutari that she came on arrival, and there she had her headquarters. The abuses complained of in the *Times* were especially evident here because of the great overcrowding, the more unhealthy situation, the prevalence of cholera and other infections, and the fact that the means of transport across the Black Sea was very poor, so that the wounded arrived at Scutari in the last stages of exhaustion, in a condition when the lack of suitable food and the general inefficiency worked greater havoc.

The party arrived at Scutari on November 4, 1854. The Battle of Balaklava had been fought on October 25, and that of Inkerman on the day before their arrival, and the wounded were pouring in. The hospital was a huge place, capable of accommodating over 2000 patients (the maximum at one time was 2434, on December 23, 1855), and containing, in its overcrowded state, over four miles of beds, eighteen inches apart. In a letter written on November 14, Miss Nightingale writes that there were 1715 sick and wounded (among whom were 120 cholera patients), in this hospital, and 650 in the other building, called the General Hospital, of which they also had charge, "when a message came to prepare for 510 wounded arriving in half an hour from the dreadful affair at Balaklava. Between one and nine o'clock we had the mattresses stuffed, sewn up, laid upon the floor, the men washed and put to bed, and their wounds dressed." It was with such numbers and with similar emergencies, under circum-

stances of extreme complexity, that Miss Nightingale had to cope, during that first six months.

The fact that there was gross maladministration in every department of these hospitals at the time of her arrival, has been clearly established by the Royal Commission appointed at the time. The trouble was partly due to an organization without central authority, partly to gross ignorance of ordinary hygiene, partly to the want of the woman's touch, and in part doubtless to the real lack of capacity of certain officials to deal with a novel situation. Miss Nightingale brought all her powers of tact, courage, judgment and resolution to meet the exigencies of the case. The large public funds that had been placed at her disposal by the *Times* and other sources, as well as her own private income, enabled her to tide over a situation otherwise hopeless; but the problem remained to meet these urgent necessities within the limitations set by military rigidity and professional jealousy, for she realized from the outset that strict discipline must be observed by herself, and a proper subordination to the medical officers in charge. Much has been said of her "irregular" methods of cutting the Gordian knots of her dilemmas by supplies from her own reserves or by deliberate and unauthorized invasion of the purveyor's stores. But she never neglected to support such action by a medical requisition, and investigation shows that she never set authority causelessly aside. Rather she had the insight of that perfect discipline, which recognizes the point at which the breaking of the *letter* is the fulfilment of the *spirit* of the law!

Many of the difficulties are detailed in her letters to Lord Herbert, with suggestions for their redress. Thus, on her arrival there was no provision for the cleaning of the hospital, "not a basin, or towel, or piece of soap, or a broom," and her first requisition was for 300 scrubbing brushes! The patients' linen was not washed, and the bedding was only rinsed through in cold water, for the contract made by the purveyor with this object broke down before the convoys from Inkerman came in. Her first step was the renting and equipping of a Turkish house as a laundry, and the placing of the soldiers' wives at the washtubs. There was no clothing in the purveyor's stores, while, by a curious command, the soldiers had been required to leave their knapsacks before the Alma, in order to "march light" towards Sebastopol. In consequence the wounded arrived half naked and destitute of kit where they to leave the hospital. "I am clothing the British Army," she wrote. Again on her arrival she found the entire cooking done in thirteen large boilers, with no provision whatever for extra diets or special delicacies between courses, and by an extremity of red tape so that rations



were served *raw* in small quantities for each patient. "This practice," writes Miss Nightingale to Lord Herbert, "seems invented on purpose to waste the time of as many orderlies as possible, and it makes the patients' meals late, because it is impossible to get the diets thus drawn, cooked before three or four o'clock. The scene of confusion, delay, and disappointment, where all these raw diets are being weighed out by twos, and threes, and fours, is impossible to conceive, unless one has seen it, as I have, day by day. Why should not the Commissariat send at once the amount of meat, etc., required, to the kitchens, without passing through this intermediate stage of drawing by orderlies?" One of the most important measures introduced by her at the Barrack Hospital, was the opening, within 10 days of her arrival, of two extra diet-kitchens, and the placing of three supplementary boilers for arrowroot on various staircases. A few months later the great Soyer joined her as a volunteer, and took over the management of this invaluable part of the work.

And so with a thousand other details of management and equipment. She organized relief measures for the women camp followers, provided reading rooms for convalescent soldiers, engaged and superintended 200 builders in the emergency repair of a large part of the hospital, trained orderlies in sanitary measures, and herself did the work many times of a sanitary engineer, everywhere applying the expert's touch. But all this would have been ineffectual had she not had behind her own action the intelligent and informed power of those in authority at home. Her long days were followed by nights of letter-writing, when she indicated clearly to high sources what the necessary reforms were, and just how they should be carried out. Not only had she the loyal support of Lord Herbert and his colleagues, but the Queen herself was behind the prompt execution of her suggestions, and this was one of the most important sources of what was called by her enemies "The Nightingale Power." Among other measures enacted at her suggestion, it was due to the Executive Sanitary Commission, appointed in the winter of 1855, to act with plenary powers on the spot, that the horrible sanitary conditions of the hospital, which may be said to have overlain a great cess-pool, were removed. The death rate fell as the result of the action of this Commission, with remarkable rapidity.

But there was still another side of her activity—and that the ceaseless keynote of the whole, to which all her functions of administrator and reformer were, in a sense, secondary. "A Ministering Angel Thou!" Her devoted care of the patient, personal sympathy for the sufferer, skillful tending of the exhausted, and faithfulness to the dying—all those qualities that went to make the Lady-in-Chief at once the Queen of Nurses and the adored of the

wounded soldiery, shone day and night through those crowded wards at Scutari like the beam of her own lamp!

In the spring of 1855 Miss Nightingale crossed the Black Sea to the Hospitals of the Crimea and remained there for some time. The physical strain upon her here was great, for the several hospital buildings were distant from each other, and she was obliged to go from one to another, often in the depth of night, over rough country. With her strength undermined by the strain of the work at Scutari, she fell ill of Crimean fever, and nearly died. It was when the news of her recovery reached an anxious England, that the popular feeling for her, which had been growing stronger ever since the day it was discovered that the "Mrs. Nightingale" of the Nursing Expedition was a young and beautiful woman, and which was being constantly enhanced through countless grateful letters home from wounded and dying soldiers, burst all bounds, and a wave of tenderest enthusiasm swept England from shore to shore. A public meeting was called in London "to give expression to the general feeling that the services of Miss Nightingale in the East demand the grateful recognition of the British people." The room was crowded to suffocation with the flower of England's men and women, her own parents among them. The speeches were beautiful, and were touching to a degree in their perfect recognition of the single-minded spirit in which her wonderful work was done. Dearest of all to her heart—perhaps the only part of it all for which she really cared at all—was the joy that this public recognition of her work brought to her parents and to her sister, Lady Verney, long since reconciled to her purpose, and now understanding her at last.

It was at this meeting that the Nightingale Fund was inaugurated, "to enable her to establish and control an Institution for the training, sustenance, and protection of nurses, paid and unpaid." This fund was later applied by her to establish a training school for nurses at St. Thomas's Hospital. The flood of popular enthusiasm rolled on through the British Dominions, and public meetings in support of her fund were everywhere held. And the Queen honored her with a beautiful jewel, especially designed for her by the Prince Consort.

After recovery from her illness, Miss Nightingale was urged to return to England, but she insisted on remaining at her post, part of the time at Scutari and part at the Crimea, until after the termination of the war. It was on August 4, 1856, four months after the Treaty of Peace was signed, that she reached again her native land.

Public excitement was intense at the thought of her expected return, but, as Lord Ellesmere had said, speaking on May 5 in the House of Commons, "she is probably planning now how



to escape as best she may, on her return, the demonstration of a nation's appreciation of the deeds and motives of Florence Nightingale." She arrived at Lea Hurst from Paris unrecognized, under the name of Miss Smith, and walked unaccompanied from the little station to the protection of her home.

Disappointed of a public demonstration, the Press overflowed with admiring tributes in poetry and prose. With his usual timeliness, Mr. Punch published several excellent poems. One of these, which appeared on August 23, 1856, mirrors so well the sympathetic understanding and the real affection that swayed the British public of her day, that it is in the truest sense historic, and for that reason may be quoted here.

#### THE NIGHTINGALE'S RETURN.

"Most blessed things come silently, and silently depart.

Noiseless steals springtime to the year, and comfort to the heart.

And still and light, and gentle, like a dew, the rain must be

To quicken seed in furrow and blossom upon tree.

"Nile has his foaming rapids, freshets from mountain snows,

Yet, where his stream breeds fruitfulness, serene and calm he flows,

And, where he overbrims, to cheer his banks on either side,

You scarce can mark, so gradual, the swelling of his tide.

"The wings of angels make no stir as they ply their work of love,

Yet by the balm they shed around, we know them that they move.

God spake not in the thunder, nor the mighty rushing blast,

His utterance was in the still small voice that came at last.

"So she, our sweet Saint Florence, modest, and still, and calm,

With no parade of martyr's cross, no pomp of martyr's crown,

To the place of plague and famine, foulness and wounds and pain.

Went out upon her gracious toil, and now returns again.

"No shouting crowds about her path, no multitude's hot breath,

To fan, with winds of vanity, the doubtful fires of faith.

Her path by hands official all unsmoothed, her aims decreed,

By the Levites, who, when need was, passed on the other side.

"When titles, pensions, orders by random hand are showered,

'Tis meet that, save with blessing, she still should walk undowered.

What title like her own sweet name with the music all its own?

What order like the halo by her good deeds round her thrown?

"Like her own bird, all voiceless when the daylight songsters thrill,

Sweet singer in the darkness, when all songs else are still,

She, in that night of darkness that turned other hearts to stone,

Came, with soft step and gentle voice, yet wise and firm of tone,

"Think of the prayers for her, that to praying hearts came back

In rain of blessings, seeming still to spring upon her track.

The comforts of her graciousness to those whose road to death

Was dark and doubtful till she showed the light of love and faith.

"Then leave her to the quiet she has chosen. She demands

No greeting from our brazen throat, and vulgar clapping hands.

Leave her to the still comfort the saints know that have striven.

What are our earthly honours? Her honours are in Heaven."

Punch, Aug. 23, 1856.

#### IV. THE PERIOD IMMEDIATELY FOLLOWING THE CRIMEAN WAR. (1856-1861. PLATES

##### VIII, IX, X, XI.

The dissimilarity between the early and the late portraits of Miss Nightingale has often been remarked. This is not entirely due to the fact that the earlier ones are mostly light crayon drawings, the later, photographs "taken by commandment of the Queen" on her return from the East; nor is it to be explained by the natural changes occurring in the transition from young maidenhood to early middle age. There is in the best of these later portraits to be clearly traced the birth of a great experience. She has seen and partaken of the travail of the world's tragedy, and it has left its indelible mark upon her face. The qualities, too, that she has gained in the great conflict are visible. This is especially true of the charming little head shown in Plate IX. Endurance, unflinching decision, tempered with the kindly tolerance born of a great sympathy, even a humorous appreciation of the frailties of officialdom, are all expressed in the fine curves of the mouth, while in the eyes is the deep contentment of one who has seen the Vision, and knows of the foundations of her faith.

During the five years following the Crimean War, and especially during the immediately succeeding time, Florence Nightingale needed every spark of spiritual force which had come to her from the fires through which she had passed. She and her friend Sydney Herbert, with other loyal coadjutors, were together to shoulder a burden of reform under which immediate action was so imperative, that only by unrelaxing effort could results be achieved. The strain was of a different kind from that in the Crimean hospitals, but the task to be accomplished was even more gigantic. On the other





PLATE VIII. MISS NIGHTINGALE (ABOUT 1856).  
(Taken by order of the Queen shortly after her return from the Crimea.)

From a picture in the possession of the Canadian Nurses' Association, Montreal.

hand, the unremitting energy demanded of her told upon her weakened frame, and she became permanently invalided, and saw all her dreams of an active life among the hospital training schools she was about to inaugurate, permanently denied her. Moreover, during these years she was to see Lord Herbert himself sink under the work. He died in 1861, before he had accomplished what she called the "main-spring" of the whole,—the reform of the internal organization of the British War Office. His death was a blow from which she never quite recovered. During these five years they were in constant communication and consultation, and were allies in the truest sense, giving to each other a comradeship and a loyal support and understanding that was essential to the great results that they attained. Their work was in a sense complementary, for she had the administrative, he the political and executive mind (Sir Edward Cook). Their relationship is to be recognized as one of the great friendships of all time, and in a sense it is unique in history. Sydney Herbert was a man of immense charm, with a devoted wife who shared his every thought, and between whom and Miss Nightingale there existed a

close intimacy and a strong spiritual tie. Not the least part of the great inheritance that Florence Nightingale has left to her sex, is the fact that such true friendship between man and woman can and does exist.

Only the first few days of Miss Nightingale's return to England were given up to personal matters. The consciousness pressed home that her experience in the Crimea must not be allowed to sink, even temporarily, into oblivion, but that the iron of public opinion must be struck while still hot, if the evils under which the soldiers had suffered were not to be repeated and perpetuated. The remarkable change wrought in the mortality of the hospital at Scutari by Miss Nightingale and her supporters during the first six months of the war was to be looked upon as a sanitary experiment of the most brilliantly successful kind. It was of vital importance to the future welfare of the army that the evils fought against and corrected in the Crimea, should be exposed in a Royal Commission of enquiry, and that action should be taken against their repetition while indignation still burned hot in public sentiment. Miss Nightingale was keenly alive to the horror that had surrounded her in the Crimea, and never forgot that mortality rate of 60% in the Scutari Hospital during the first weeks of her stay there, that blackened the good fame of the British Army regulations. Among her private notes of 1856 is written, "I stand at the altar of the murdered men, and while I live I fight their cause."



PLATE IX. MISS NIGHTINGALE ON HER RETURN FROM THE CRIMEA.

From a photograph in the collection of the late Mr. J. B. Leamont, Montreal, reproduced also by the London Stereoscopic Company.



The required reforms were already the subject of serious discussion between herself and Lord Herbert. It was at this juncture on August 23, 1856, a fortnight after her return, that she was given the opportunity by an invitation to Balmoral Castle, of personally setting forth to Her Majesty the sufferings of the Queen's Army in the East, and their possible means of redress. Her preparation for the interview was thorough. In consultation with those who had the cause of medical reforms at heart, by the study of statistics, by enquiries; and by the collection of her own notes and memoranda, she armed herself to make the utmost use of her great opportunity. Nor was she disappointed. The Queen and the Prince Consort together gave her their fullest attention. "She put before us," wrote the Prince in his diary, "all the defects of our present hospital system, and the reforms that are necessary. We are much pleased with her; she is extremely modest." Nothing could be done, however, without the action of Ministers, and although she returned to London apparently successful, many months of delay and strenuous insistence were to elapse before a Royal Commission, with Lord Herbert as chairman, could be appointed. This took place by Royal Warrant on April 26, 1857, shortly after the publication and circulation of Miss Nightingale's comprehensive private report, entitled, "Notes Affecting the Health, Efficiency, and Hospital Administration of the British Army." This book created a profound impression. Sir John McNeill writes repeatedly in appreciation of its clearness and vigor, and ends, "I think it contains a body of information and instruction such as no one else, so far as I know, has ever brought to bear upon a similar subject. I regard it as a gift to the Army, and to the country altogether priceless."

The Commission appointed, its duty was to submit a report of the abuses and projected reforms, to the House of Commons. Miss Nightingale's own evidence took the form of thirty-three pages of written answers to questions in the "Blue Book" report. "It was distinguished," in the words of an Army doctor of the time, "by a clearness, a logical coherence, a pungency and abruptness, a ring as of true metal, that is altogether admirable."

The Report itself was written by Mr. Herbert, with much assistance from Miss Nightingale. It recommended the appointment of four sub-commissions, whose functions should be: to put the barracks in sanitary order; to organize a statistical department; to institute a medical school; to reconstruct the Army Medical Department, and to revise its hospital regulations. To it was appended a statistical study made by Miss Nightingale, of the civil and military mortality statistics in certain London parishes, from which the startling fact revealed itself that the rate of mortality among the sol-



PLATE V. MISS FLORENCE NIGHTINGALE.  
BY THE REV. FREDERICK H. COLLINS.

From a photograph in the possession  
of Dr. Collins Warren, Boston.

diers living in barracks was five times as great as that of civilians living at home. To force this existing fact, namely, that the Army in time of peace was being exposed to the effects of bad sanitation with disastrous results, upon the attention of the House, meant a hearing, which perhaps the evils of the Crimean War, already becoming a thing of the past, might possibly not obtain, even so soon after the terrible events. After much activity on the part of all interested, the Report was formally acted upon, and the four sub-commissions authorized. They immediately set to work, with Miss Nightingale the heart of each, herself now ill and weak from the prolonged exertion of these strenuous months, after the strain in the Crimea. It was quite possibly the effects of these months of unrelenting exertion, at a time when her body demanded rest, that left her a permanent invalid. A diagnosis of Miss Nightingale's malady has not, so far as we know, been framed, but her own statement about herself in her letters to her medical friends, suggest that she suffered from some form of cardiac insufficiency associated with cardiac dilatation and a paroxysmal tachycardia. Even at her lowest ebb, she never put aside her harness, but met emergencies as they arose, until in February, 1858, the various investigations made and the resulting recommendations embodied in a second Report from the Commission.

The results were worthy of the high prize she paid in the permanent sacrifice of her health. Each commission carried out its work through to a successful issue, and the results that are felt more and more in the right directions. The Crimean War, which had taken a leading place in her life, and which Miss Nightingale's "Notes" had made the greatest importance of the world's history, peace, and political life, was now being



in it, and which made it possible for her to inspire these far-reaching reforms.



PLATE XI. MISS NIGHTINGALE  
(IN 1858)

From a photograph by Goodman in  
the possession of Dr. Collins Warren,  
Boston.

The results of the work of the four sub-commissions may be briefly summarized as: the better barrack accommodation and military hospital construction, which have resulted in the improved health of the British soldier at home today; the revision of army medical statistics and the establishment of British army statistics on a higher plane than that of any other country in the world at that time, a task in which the statistical skill, energy, and persistence of Miss Nightingale was united with the experience of the celebrated Dr. William Farr; the foundation of the Army Medical School, and the splendidly equipped Royal Medical College; and the formulation of a code for regulating the relative duties of regimental medical officers, and organizing the detail of the internal administration of military and other hospitals.

The third sub-commission, to establish an Army Medical School, had the longest and weariest struggle against the obstruction of subordinates of them all, but it accomplished most important results. The Army Medical School, afterwards removed to Netley, was peculiarly Miss Nightingale's child, and she watched over its early progress with earnest solicitude. In every part of the administration the professors sought her assistance, and she made a successful fight, against much opposition, to have pathology recognized in the professoriate. Her services as the true founder of the School were acknowledged at the time. Dr. Longmore, the professor of military surgery, told the students that it was she "whose opinion, derived from large experience and remarkable sagacity in observation, exerted an especial influence in originating and establishing this school." "For

originating this school," wrote Sir James Clark, "we have to thank Miss Nightingale, who, had her long and persevering efforts effected no other improvement in the army, would have conferred by this alone an inestimable boon upon the British soldier."

Apart from the work of the commissions, many other army reforms were instituted by Mr. Herbert and inspired by Miss Nightingale. Such were the committee to reorganize the Army Hospital Corps and the Soldiers' Recreation Clubs. The latter were organized by them with much success, not only in England, but at Gibraltar, Chatham and Montreal, which was then a military post. The regimental institute attached to every modern barrack is the direct outcome of this branch of their pioneer work.

Such is a brief outline of the epoch-making work carried on by Sydney Herbert and Florence Nightingale during these five years immediately following her return from the East. Great as it was, however, these reforms in army sanitation were not by any means the only side of her activities during this period. Of equal importance was: (1) her work in the reform of modern hospital construction as a whole, (2) in the introduction of statistical forms for hospital use, and (3) especially in the foundation of modern nursing.

Miss Nightingale's prestige in matters of hospital construction was recognized before her book, "Notes on Hospitals," appeared, in 1858. This book was written in connection with her work on the first sub-commission, and is a technical study of the subject supplemented with numerous maps and diagrams, and recommending the elementary principles of sanitation, which were not then generally recognized, and the pavilion system. "It appears to me," wrote Sir James Paget, "to be the most valuable contribution in application to medical institutions I have ever read." After its appearance she was widely consulted on hospital construction at home and abroad, and revised the plans of many hospitals erected in Great Britain, Germany, Belgium, Spain, France, India and America.

Her work as a *statistician* has already been referred to and her alliance with Dr. William Farr. Her statistical forms for the use of hospitals were presented at the International Congress in London in 1860, and were introduced in the leading London hospitals. On June 21, 1861, a meeting was held at Guy's Hospital and it was unanimously agreed—by delegates from Guy's, St. Bartholomew's, St. Thomas's, the London, St. George's, King's College, the Middlesex, and St. Mary's—"that the metropolitan hospitals should adopt one uniform system of registration of patients; that each hospital should publish its statistics annually, and that Miss Nightingale's Model Forms should, as far as possible, be adopted."

Her work in the *foundation of modern nursing*



ing has been described as one of the three great contributions of the nineteenth century to the relief of human suffering in disease. In the alleviation which it has supplied it takes rank with the discovery of anesthesia by Sir James Simpson, and asepsis by Sir Joseph Lister.

The Nightingale Training School for Nurses was opened at St. Thomas's Hospital on June 24, 1860, under the administration of the Nightingale Fund, which amounted to £44,000, raised throughout the British Empire, as a tribute to the Crimean heroine in 1855. Miss Nightingale planned every detail in its organization, and assisted the first matron, Mrs. Wardroper, in the discharge of her activities. She herself interviewed and accepted candidates and others, and afterwards preserved the closest touch with the pupil nurses and graduates. The influence of the school spread rapidly, and the Nightingale nurses, both in Great Britain, the Colonies, and the United States, made their way as superintendents. The Blockley Hospital in Philadelphia, and the Montreal General Hospital here, were two of those that owned a Nightingale superintendent. In Germany, Sweden, France, and Austria, too, the lead was followed, and nurses were trained along the same lines. Thus the seed that was carried by Pastor Fliedner from Elizabeth Fry in London to Kaiserswerth in Germany, was transplanted by Florence Nightingale again on English soil, and grew into a mighty tree.

It has been well said that Miss Nightingale did not originate the idea of trained nursing of the sick, for there were sisterhoods and great nurses before her time. What she did do was to place the art of nursing on the plane of a profession, and to transfer it, as the books of the British census show, from the category "Domestic," in which it stood before her time, to that of "Medicine." Both by precept and example she taught and tried to instill into her nurses the principles and the code of honor that raise an occupation into a profession. She raised a great enthusiasm among the women of her time, many of whom grasped her meaning, and worked with her to attain this end. She took it out, too, of the place in which it had been put before her time by the religious orders, who regarded their nursing chiefly as a means of self-abnegation and humiliation. She believed, no one more strongly, that the true nurse must have a sense of vocation, and that without it she should not enter the profession, and with her "nursing was a sacred calling, only to be followed to good purpose, by those who pursued it as the service of God, through the highest kind of service to man." But she recognized also, that the skilled services of the trained nurse should form an honorable means of livelihood, and insisted on the public recognition of this fact. Miss Nightingale never thought or cared about what has been called women's rights, but she was essentially a pio-

neer in the interests of her sex. By the high estimate and value she placed upon the skilled services of women in a capacity in which only they can serve, she raised the public sense of the value of those services all along the line, and there is probably no other woman to whom modern women owe so much. Her words on the subject of the modern feminist movement, which was just beginning in her day, and which close her little volume "Notes on Nursing," are an epitome of wisdom, and strike directly home.

*"I would earnestly ask my sisters to keep clear of both the jargons now current everywhere (for they are equally jargons); of the jargon, namely, about the 'rights' of women, which urges women to do all that men do, merely because men do it, and without regard to whether this is the best that women can do; and of the jargon which urges women to do nothing that men do, merely because they are women. Surely woman should bring the best she has, whatever that is, to the work of God's world, without attending to either of these cries. It does not make a good thing, that it is remarkable that a woman should have been able to do it. Neither does it make a thing bad, which would have been good had a man done it, that it has been done by a woman.*

*"Oh, leave these jargons and go your way straight to God's work, in simplicity and singleness of heart."*

The "Notes on Nursing" was published in 1860. It is the best known of her writings, and in the purity of its English, the vigor and simplicity of its style, and the fundamental soundness of its teaching, is in the highest sense a classic. It is a book which anyone may read with delight and information today, and should be republished in popular form. Florence Nightingale possessed the literary faculty in a very high degree, and was a voluminous writer, but she held this, as she did her social accomplishments, very lightly, to be used only as a means to an end, and to be considered, rather as a "temptation" to be avoided, that might lead her away from the purpose to which she had consecrated herself, and never as an end in itself. This is the reason, that although her contributions to the literature of her time are as important and probably as numerous as those of her illustrious contemporaries, Mrs. Gaskell, George Eliot, and Harriet Martineau, they are not recognized as such, for they are largely on technical subjects and many of them are hidden in the Blue Books of the day. It is only when she is dealing, almost as it were by accident, with subjects of wider and social scope, that her power of literary expression and her clearness of vision in the realm of abstract thought are fully revealed to us. The best illustrations are to be found in her lengthy correspondence with such men as William Llewellyn and John Stuart Mill, and in her great religious and sociological treatise, entitled "Suggestions for



Thought to Searchers for Truth among the Artizans of England and to Searchers after Religious Truth," published in three volumes, containing 729 pages in all, by Eyre and Spottiswoode, London, in 1860. Her yearly "Addresses to the Probationer Nurses in the 'Nightingale Fund' at St. Thomas' Hospital," printed for a limited private circulation during the years 1873 to 1888, stand out also as models of clear diction embodying principles of deep ethical and spiritual force. The nineteenth century has been called pre-eminently the century of great women. It is from the literary and philosophic, as well as the philanthropic side, that Florence Nightingale possesses an eminent place within the circle.

(To be continued.)

## Society Report.

### NEW ENGLAND PEDIATRIC SOCIETY.

THE FORTY-FOURTH MEETING OF THE NEW ENGLAND PEDIATRIC SOCIETY WAS HELD IN THE BOSTON MEDICAL LIBRARY, FRIDAY, APRIL 28, 1916, AT 8.15 P.M.

The President, DR. A. C. EASTMAN of Springfield, Mass., was in the chair.

The following papers were read:

#### I. SOME PHASES OF THE RECENT EPIDEMIC OF "ACIDOSIS."

By P. H. SYLVESTER, M.D., NEWTON.

#### II. IDIOSYNCRASY TO COW'S MILK. ITS RELATION TO ANAPHYLAXIS.\*

By FRITZ B. TALBOT, M.D., BOSTON.

#### III. THE TREATMENT OF TUBERCULOSIS IN INFANCY.†

By W. W. HOWELL, M.D., BOSTON.

#### DISCUSSION.

DR. TALBOT (Dr. Sylvester's paper): Dr. Sylvester's paper has been very interesting and his experience is very much like mine. I want to draw attention to one statement which he made, that in speaking of acidosis and using the term acidosis, of the relation of ammonia to the total nitrogen in the urine as being of importance in determining an acidosis. This is in the main true when there is

sufficient protein in the diet. The total nitrogen in the urine depends upon the protein in the food while the ammonia is more or less independent, so the relation becomes distorted and has no significance when there is a low protein in the diet. This should be borne in mind when anyone is drawing conclusions from the ammonia ratio. In the cases which I saw, one thing impressed me a good deal and that was the loss of water due to the extreme vomiting which did not allow water to get into the body, and the diarrhea, which withdrew water and salts from the body. I personally subdivide these conditions that we have been dealing with this winter, and previous years, into vomiting with acetouria as shown by small amounts of acetone in the urine and vomiting—which is very common—and true acidosis. The only way that we have to determine true acidosis is by tests that are too difficult for physicians to use in their private work with the exception of the test recently advised by Marriott of Baltimore, in which the carbon-dioxide tension of the alveolar air can be determined very simply, by collecting the air in a rubber bag and running the air into a solution of 1/100 normal alkali and phenolphthalein, and comparing the resulting color with a set of tubes which give us known quantities of carbon-dioxide in the air. By them we can tell whether the alveolar tension is 40, 30 or 20, or even lower. It very rarely goes below 20. True acidosis is shown clinically by a diminished carbon-dioxide tension in the alveolar air. This is because, as Dr. Sylvester suggested, the salts are not present in large enough amounts to carry the carbon dioxide in the blood to the lungs. Clinically it is manifested by what we know as air hunger, and I believe that when we see air hunger we see acidosis, and when we do not see air hunger we have vomiting with acetouria. In some of the instances, I believe that what we call vomiting with acetouria does change into true acidosis, and I believe that the factor that decides whether it is or is not true acidosis is whether the body responds to alkali or not. The symptom upon which that is dependent in large part is diarrhea.

DR. SYLVESTER: (1) I would like to ask Dr. Talbot if he feels that there is any sharply dividing line between the children with air hunger with true acidosis, and children who have "vomiting with acetouria"? Do you think that the children who have vomiting with acetouria have sighing respiration or evidences of difficulty with respiration, or definite air hunger?

(2) Given a child who had a readily controlled acetouria with vomiting and who was having a certain amount of sighing respiration, would you put that in the same class as a child with a true acidosis?

DR. TALBOT (Dr. Sylvester's paper): (1) I think that true acidosis is not a disease but a symptom. It is a late symptom which occasionally comes in the conditions that we have been talking about.

(2) If there is deep respiration you have air hunger and this is true acidosis; the air hunger may be like the other symptoms, it may be pronounced or it may be mild, and it is impossible to draw a sharply marked dividing line between whether there is air hunger or whether there is not. In the cases of air hunger which I have seen it has come on very quickly within one or two hours' time.

\* See JOURNAL, page 409.

† See JOURNAL, page 411.



DR. CALDER (Dr. Talbot's paper): I wish to refer briefly to a case that came under my care. The baby was breast-fed, nine months old, when cow's milk was first given. This was taken all right and there was no vomiting, but the child had a very profuse urticaria in about one-half hour after taking. The breast milk was resumed and whenever attempts were made to give cow's milk in any quantity whatsoever the urticaria resulted and on several occasions an asthma with the urticaria. The child was given goat's milk once. This had to be forced and the child showed much more distaste for it than for the cow's milk. It was vomited almost immediately and was followed by a very intense asthma and urticaria. This child was nursed on the breast until one year, having cereals in the mean time and butter, which caused no general reaction although there was some local irritation where it had touched the skin of the face. This local irritation disappeared after the child had been given the butter for a few months. The child was brought along on cereals, butter and lamb juice, and to some extent on lamb meat, and potato, fruit juices and vegetables. The milk tolerance was increased by feeding the child  $\frac{1}{2}$  drachm every other day, gradually increasing the amount, it being six months before the child was able to take 8 oz. of cow's milk a day. This child had also an anaphylaxis to egg.

DR. TALBOT (after Dr. Calder's remarks on Dr. Talbot's paper): I was very much interested in the case that Dr. Calder reported. Evidently this baby was sensitive both to the milk of the cow and the goat, unless someone substituted cow's milk for goat's milk.

DR. TALBOT (Dr. Howell's paper): All the cases that we have had at the Massachusetts General Hospital with a positive von Pirquet under two years of age, except one, died. That one, so far as I know, is living. All the others that had negative von Pirquets that died that showed that they had tuberculosis, as I remember it, died of milinary tuberculosis. It is quite natural in infants dying of such disease, I think that there should be no repair. If there is repair, they will get well. If they get well and die of something else, how can you tell whether the disease came on during the first or second year of life? My impression of this discussion is that we are talking about human tuberculosis. I feel that in discussing this question, we have neglected bovine tuberculosis. At present in the findings in tuberculosis of the glands our impression is in the post-mortems, that more than half of them gain their entrance through the mesenteric glands and for that reason, and backed up by the work of the Royal English Commission, it looks as if much of the tuberculosis of infancy was of bovine origin. Again if it is of bovine origin, I should think if one tubercle bacillus were fed to that child every day that that child would have 1000% less chance of life than if only one tubercle bacillus gained entrance and the body had a chance to kill it.

DR. DENNY (Dr. Howell's paper): Dr. Howell expressed the opinion that there was danger of re-infection in children and Dr. Dunn expressed the opinion, as the result of his pathological work, that there is very little danger of re-infection. It seems to me that this is a very important question to know more about. It has a very practical bearing on the question as to whether it is safe to send a young child to a hospital where there are cases of open tuberculosis. I would like to hear some other opinion on that subject.

DR. SMITH (Dr. Howell's paper): Dr. Howell says that these cases ought to be treated as tuberculosis, and that they always have the disease. I would like to ask what he calls these cases when they get to be 10 or 15 years old—does he say that they have tuberculosis then?

DR. SMITH (Dr. Howell's paper): I would like to ask what distinction is made between tubercular infection and tuberculous disease. That distinction is one that ought really to be made. As I understand the distinction, tuberculous infection means the presence of tubercle bacilli in the body which are not active; tuberculous disease includes all cases during the active stage. These two types of the disease should be differentiated, for the treatment is quite different.

DR. DENNY (Dr. Howell's paper): I have only two objections to bring forward to the conclusions in Dr. Howell's paper; one of them is really not an objection. He speaks of the lesion at the portal of entry and the associated lymph-node process, as if both were included under the term primary lesion. This, I think, might give rise to some confusion in connection with the question as to whether there is or is not a lesion at the portal of entry. It would be better, I think, to speak of the primary pulmonary lesion and the associated lymph-node process together, as the primary stage of tuberculosis, and to confine the term primary lesion to the process found in the parenchyma of the lung. The question as to whether there is such a primary lesion at the portal of entry has been one of the disputed points in the pathology of tuberculosis. In my experience, such a lesion can always be found if carefully looked for.

I have been working on tuberculosis a good deal at the Infants' Hospital, and one point which has struck us is the close relationship between tuberculosis and syphilis. I think that tuberculosis, like syphilis, can be divided into primary, secondary, and tertiary stages. Some authorities regard the phthisis of adults as representing the tertiary stage of an infection acquired in infancy. I am in doubt as to whether this is a true distinction, but many observers believe that the phthisis of adults does not represent a fresh infection from without, but represents the lighting up of an old process, or a retrograde infection.

Another point in which I differ from Dr. Howell is, when he speaks of the danger or frequency of fresh infection from without. The study of the pathological material which we have been engaged in has rather convinced me that this is not a very great danger and that it very rarely occurs, and that the various widespread manifestations so characteristic of tuberculosis in infancy and childhood do not represent a fresh infection from without, but rather an extension from the lesions of the primary stage. This extension appears to take place in a very well-defined way so that it can be treated as nearly all post-mortem cases.

The trouble with tuberculosis in infancy, as Dr. Howell has said, is that the danger is not recognized until the secondary stage is developed. The majority of cases of disseminated tuberculosis in infancy depends on the extension of a primary tubercular meningitis or a tubercular pneumonia to the lungs, bronchopneumonia, or some other form of pneumonia. The secondary stage, as Dr. Howell says, which has been very extensively studied, is the lighting up of tubercle bacilli which have been in the body since birth. I have seen a number of these cases in the American Journal of Pathology.



any good distinction between chronic pulmonary tuberculosis and the signs of the secondary lesions in the lungs found in children. It would be too much to say that chronic pulmonary tuberculosis is never found in the lungs of infants and children. Occasionally there is a condition of extremely increased activity of growth in the tiny primary focus which almost amounts to the lesions of phthisis. The usual changes in the lungs clinically may resemble consumption and may show the physical signs which are described in text-books as characteristic of phthisis and may run the same clinical course. But from the pathologic point of view these lesions are not the same as in the phthisis of adults, which represents an entirely different proposition. Tuberculous bronchopneumonia is the lesion characteristic of infancy and early life, acute phthisis being only rare.

We have been comparing the various clinical manifestations with anatomic findings. We have had a large number of tuberculous autopsies, but the main thing, as Dr. Howell says, is to make the diagnosis in an infant before the secondary stage has developed. That is the thing which has not been done. The diagnosis of tuberculosis either rests on finding signs of solidification of some kind in the lungs or on the existence of some other well-recognized form as meningitis or peritonitis. Without these signs, the diagnosis of the primary stage rests on three things,—the von Pirquet reaction, the enlargement of the bronchial lymph nodes, when they can be detected on physical examination, and when they cannot be detected, on an x-ray examination.

DR. DUNN (Dr. Howell's paper): The term infected with tuberculosis but not diseased is not applicable, because these infants are always in extreme danger. The number of infants which develop secondary processes which are fatal is very large. Another thing which bears on that point is that in children under two you practically never see the slightest tendency toward healing of the tuberculous lesion or repair. It is not such an important question as to how long we shall consider them subjects of tuberculosis, because there is absolutely no permanent way in which we can tell when the actual tuberculous infection dies out except through very careful examination of anatomic material. Certainly in children under two it seems to me to be a much better thing to regard every child that shows evidence of infection with tuberculosis as a victim of tuberculous disease and to treat it in that way.

DR. HOWELL: I made the statement that I criticized the terms tuberculous infection and infected with tuberculosis merely because I believe that the primary stage of tuberculosis or the primary lesion always gives symptoms—that is, when a baby is infected with tuberculosis he probably has a reaction at that time. He may have fever. I have never seen a case at the beginning of the primary stage but I believe there are always symptoms. So I do not see why he has not a disease merely because he does not have symptoms recognized as those of tuberculosis. He always has the glands, and they are active enough to keep up his reaction shown by the von Pirquet. He always reacts, so he always has a diseased process. The expression infected with tuberculosis always makes me think of the old physician who called a surgeon in consultation from Chattanooga, Tenn., to see a case of inoperable

uterine cancer. The surgeon asked the old physician if he had ever considered it was cancer, and he replied that he had never made up his mind that it was really cancer, but he had always suspected it was of a cancerous nature. To my mind the term infected with tuberculosis comes into that class. If you are getting symptoms that cannot be explained in any other way and find glands and suspect tuberculosis, treat it as a case of tuberculosis until there is improvement. At the Infants' Hospital we see a good many babies who die who might have been saved if the disease had been recognized early. Last Sunday we had 25 per cent. of the cases in the wards with tuberculosis, the disease having been recognized in only five cases before they were admitted, and they were in the hopeless stage at that time. I think it is a very dangerous thing to make a diagnosis between infected with tuberculosis and tuberculous disease. I believe if they once have it they always have it and they are always in danger.

### Book Reviews.

*Principles of General Physiology.* By W. M. BAYLISS, Professor of General Physiology. University College, London. New York: Longmans, Green & Co. 1916.

No general work on physiology which has appeared in recent years has been welcomed more eagerly or more deservedly than this book of Professor Bayliss. The facts it presents are of fundamental interest and importance to physiologists and to progressive medical men. Many of them have been hitherto available only in the original papers scattered over a large number of publications. In bringing these together in compact and readable form, an inestimable service has been performed.

The plan of the book is admirable. Each chapter ends with a condensed summary of its contents and references to the literature of special interest. A feature which adds greatly to the book is the series of portraits of leaders in physiological investigation,—a series in itself of great interest. The attempt has been made to present important facts that deal with the subject of general physiology. There is also a consistent effort to interpret these facts intelligently. Although, as the author admits, interpretation is often a matter of individual opinion, and therefore subject to error, his contention that a logical interpretation, even though finally shown to be erroneous, is better than a muddled presentation, will be approved by most fair-minded readers. A very complete bibliography covering 82 pages is inserted at the end of the book. No worker in physiology or medicine, who desires to keep abreast of current thought, can afford to disregard the facts presented in this book.



*Lateral Curvature of the Spine and Round Shoulder.* By ROBERT W. LOVETT, M.D., BOSTON. Third edition, revised and enlarged; with 180 illustrations. Philadelphia: P. Blakiston's Son & Co. 1916.

The third edition of any medical textbook means that it has been found useful and that the principles which it enunciates are considered by competent authority to be sound.

Perhaps no branch of orthopedic surgery has had such close attention concentrated upon it as the subject of scoliosis, its origin and its cure. Despite this fact we find today that its etiology is still unsettled and its treatment far from uniform. When men of such large experience as Schultes, in Zurich; Schanz, in Dresden; Lovett, in Boston,—all differ as to the most efficient method of its control, it proves that it is a subject that demands clear description of its symptom-complex, a lucid exposition of the different methods of treatment and a nice balancing of evidence as to the relative value of these methods. These demands the book meets in a fair and impartial manner and in addition devotes a chapter to the history of scoliosis and another to faulty attitude and round shoulders. It is a book which is extremely useful to both practitioners and medical students. It embodies results of wide personal experience and displays an intimate knowledge of the work of other men.

*A Manual of Practical Laboratory Diagnosis.*

By LEWIS WEBB HILL, M.D., Graduate Assistant, Children's Hospital, Boston. Boston: W. M. Leonard. 1916.

The author's frankly stated reason for adding this excellent manual to the many other existing works on laboratory diagnosis is to provide a volume of convenient and suitable size for carrying in the pocket, which shall afford for house officers and medical students a means of immediate ready reference, unconfused by the presentation of a number of alternate methods of performing any given test. Much material usually incorporated in laboratory manuals is purposely omitted, only that being included which is practical for use by the average medical man. Hence the Wassermann reaction, the Gold chloride test and various methods of tissue staining are not included, since they are not ordinarily performed by students, house officers and general practitioners, for whom this book is intended. The work is divided into eight chapters dealing respectively with the urine, the blood, the feces, gastric contents, spinal fluids, pleural and peritoneal fluids, sputum, and such miscellaneous topics as the Gram stain, the stain for spirochaeta pallida, the Schiek test, the von Pirquet test, tables of

Gram positive and Gram negative organisms and of diseases in which leucocytosis is present or absent. Each page is printed on only one side, the blank side thereby affording convenient space for notes. The book is illustrated with eleven figures and eight plates, four of which are colored, and is to be cordially commended to the use of those for whom it is intended.

*Back Injuries and their Significance under the Workmen's Compensation and other Acts.* By ARCHIBALD McKENDRICK, F.R.C.S.E., etc., Surgeon in Charge of Surgical X-ray Department, Royal Infirmary, Edinburgh. New York: William Wood & Company; Edinburgh: E. and S. Livingstone. 1914.

A small volume of 150 pages by McKendrick of Edinburgh. McKendrick is apparently both a surgeon and a roentgenologist. He seems to be also an excellent anatomist. He discusses in succession the structure of the spinal column, the muscles and fascia, the detail of examination and symptomology, and the various x-ray and other special methods of examination.

The book is an excellent little manual. In common with many other small volumes, it lacks a brief conclusion at the end of each chapter. This is perhaps of less importance in so small a volume, but would have been a distinct addition.

Dr. McKendrick does well to call attention so convincingly to this somewhat overlooked class of injury, which is too often a permanent disability to a working man or woman.

*Skin Cancer.* By HENRY H. HAZEN, A.B., M.D. Ninety-seven text illustrations and one colored frontispiece. St. Louis: C. V. Mosby Co. 1916.

Dr. Hazen of Washington, the author of this book, defines his purpose as an effort to gather under one cover the latest views on malignant tumors of the skin, and to give his personal experience, gained chiefly in the surgical, pathological and dermatological departments of the Johns Hopkins Hospital. The subject lends itself naturally to profuseness of illustration, and this feature has been very completely exploited by the author. Many of the illustrations, which have been contributed by the author's colleagues as well as by himself, are of great excellence, others could have been omitted without detracting from the general results. Much space is devoted to the subject of treatment, and the different methods and their applicability to individual cases are very fully and fairly set forth.



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## TRANSMISSION OF POLIOMYELITIS.

As the leading article in this issue of the JOURNAL, is published an important paper by Dr. Mark Richardson of Boston, formerly secretary of the Massachusetts State Board of Health, advancing a new theory of the transmission of poliomyelitis. The author reports investigations, experience, and arguments indicating that the rat-flea is really the responsible agent in the transmission of the disease, as in the case of bubonic plague. A similar suggestion has recently been made in New York, involving a mosquito as the possible transmitting agent. This contention, however, is as yet unproved. The confirmation of Dr. Richardson's theory must rest on further observation and experiment. If, as a result, the rat-flea is determined to be the actual transmitter of the infection of poliomyelitis, a cardinal step will have been taken toward the control of this serious scourge, and Dr. Richardson's theory established as a notable and beneficent contribution to medical knowledge and human relief.

## STATE CONTROL OF MEDICAL PRACTICE.

THERE is considerable dissatisfaction in various sections of the Commonwealth with that portion of the Workmen's Compensation Act which gives insurance companies the right to "furnish" medical attendance. This right to "furnish" practically is the right to "name" the physicians who shall treat injured employees. In his admirable article, which we print in another column, Dr. Francis D. Donoghue has pointed out "some medical aspects of the Workmen's Compensation Act" which should interest all physicians. He shows that the law, since it first became effective in 1912, gave insurers the right to "furnish" treatment and that only the liberal interpretation and the influence exerted by the Industrial Accident Board gave physicians a greater opportunity to render medical aid to injured employees than was contemplated when the law was passed, if we consider the wording of the original act.

The latest important liberal medical decision of the Board, that made in the Pecott case, was reversed by the Supreme Judicial Court, and physicians have become alarmed at the possible effect of this reversal. A campaign has been undertaken for the purpose of arousing medical men to the necessity for a change in the law. Many men argue for the free choice of physicians by injured employees alone; others think that either the Industrial Accident Board or the Insurance Commissioner should be given power to supervise exclusively this important matter; and the suggestion has been made, tentatively, that a list of acceptable physicians be prepared and that the selection of a medical man by either employee, employer, or insurer be restricted only to the names given in such a list.

It should be remembered, in considering new legislation, that unrestricted choice of physicians by employees will probably result in the establishment of a state-wide fee table. Such fee tables are in effect in other states and, of course, are much below the standard of fees now being paid under the "average minimum" approval standard of the present Workmen's Compensation Act. It may be, also, that absolute free choice will tend to eliminate competition between the present 27 insurance companies and bring about the concentration of all the compensation business under one insurance com-



pany, with whom all would be required to transact business under direct state supervision. There is a possibility that the problem may be solved by the combination of "free choice" under a supervising consultant, agreeable to and appointed by the insurance companies.

While only a few of the 27 insuring companies insist upon their right to "furnish" and name physicians, these few companies insure more than one-half of all the employees covered by the compensation law. Whether this indicates that the few, with most of the business, find "furnishing" physicians more economical than "free choice" is not known. The presumption, however, is that cost is a factor and that the prestige and influence of these companies must be considered when new legislation is proposed. Whatever action the medical men take, appreciation should be shown by all of the broad spirit which has actuated the Industrial Accident Board in dealing with the rights of physicians and surgeons for service rendered injured employees

#### PROGRESS OF POLIOMYELITIS EPIDEMICS.

DURING the past week the epidemics of poliomyelitis in New York and New Jersey have shown definite abatement, whereas those in New England have shown equally definite increase. In New York City the number of cases on September 13 reached a total of 8,614, with 2,151 deaths. In New York State, outside New York City, the number of cases on this date reached a total of 2,690 with 285 deaths. In New Jersey there has been a total of 2,478 cases. There have been 1,149 cases with 288 deaths in Pennsylvania, 122 cases in Chicago and 78 in Toledo. In Illinois, including Chicago, there have been 355 cases; in Minnesota, 142; in Ohio, 94; in Mississippi, 57; in Michigan, 51; and in Iowa, 30.

In New England there have been 11 cases in Maine, 76 in Rhode Island, and 608 in Connecticut. In Massachusetts on September 14 the number of cases reached a total of 239 with 26 deaths since September 1.

At the conference of state and territorial health officials, held on August 17 and 18 at Washington, D. C., in conjunction with the United States Public Health Service, two committees were appointed, one to recommend a uniform method of collecting, recording and transmitting statistics and information regard-

ing the progress and control of the disease. This committee was composed as follows:

Surg. C. H. Lavinder of the Public Health Service, chairman; Dr. W. C. Woodward of the District of Columbia; Dr. C. St. Clair Drake of Illinois; Dr. A. G. Young of Maine, and Surg. J. W. Trask of the Public Health Service.

A national survey at the time of the meeting showed that in the thirty-eight states and territories whose representatives were present, there had been since January 1 of this year a total of 11,717 cases of poliomyelitis, the largest number ever recorded in any epidemic within the same period of time.

The second committee was appointed to propose methods for control of the epidemic, including regulations of transportation. This committee was composed as follows:

Dr. John S. Fulton of Maryland, chairman; Dr. T. D. Tuttle of Washington State; Dr. E. G. Williams of Virginia; Dr. H. H. Brackman of Minnesota and Surg. Charles E. Banks, head of the Public Health Service corps, fighting the disease at New York.

In the weekly bulletin of the United States Public Health Service for September 1 is published the report of this latter committee, whose recommendations are, in part, as follows:

"I. It is the sense of this committee that the first step proper to be taken by a State health authority, believing its territory to be in danger of an invasion by poliomyelitis from another State or part of a State, is to call the attention of the United States Public Health Service to the situation believed to be dangerous, and to request the United States Public Health Service to take whatever steps are necessary to prevent the interstate spread of poliomyelitis.

"II. The necessary steps ordinarily to be taken by the United States Public Health Service in such a contingency are believed to be:

This section describes methods to be observed in investigation of infected areas, notifications of removal, identification of travelers, permits to travel, collection of fees, and certification by private physicians.

"III. The committee supports quarantines by one State against another State, or quarantine by one community against another community in the same State. It is believed that the Federal Government through the United States Public Health Service should perform the duties of notification and certification required in interstate relations, and that the prevalence of poliomyelitis in different States and authorities can and should be made known as between communities. It is believed that unusual prevalence of poliomyelitis in a community should be reported to the Federal Government.

"IV. It is recommended that poliomyelitis should be reported to the Federal Government



local health authorities and to the State health authorities, and that State health authorities make weekly reports to the United States Public Health Service of all cases of poliomyelitis. The United States Public Health Service is asked to furnish general reports weekly.

"V. It is recommended that all persons 16 years old or under, with a clean bill of health, and removing from an infected area or district to another locality, should be kept under medical observation daily for two weeks from the date of the certificate.

"VI. It is believed that the period of isolation of a case of poliomyelitis should be not less than six weeks from date of onset.

"VII. The isolation of cases of poliomyelitis should be stringent isolation of the sick person with attendant or attendants, in a properly screened room or rooms, with disinfection at the bedside of all bodily excretions. Wherever it is possible, the removal of patients to a hospital is greatly to be preferred to isolation in a private house or apartment.

"VIII. In case of death from poliomyelitis the funeral should be strictly private.

"IX. Wherever poliomyelitis is unusually prevalent, assemblages of children in public places should be prohibited.

"X. During unusual prevalence of poliomyelitis, schools should not be opened without thorough medical supervision by a health authority. When schools are opened, beginning should be made with high schools, and proceeding to lower age groups no more rapidly than complete medical examinations can be made.

"XI. Because of the existence of unknown carriers of the infectious virus of poliomyelitis, and because the infectious virus is present in the body discharges of such persons, therefore all measures to prevent contamination by human excreta or other bodily discharges, the suppression of the fly nuisance, prohibition of the common drinking cup, and a general educational campaign for cleanliness and sanitation, with particular instruction of parents and children concerning personal hygiene, especially of the mouth and nose, are urgently recommended."

Attention is further directed to two communications published in the correspondence column of this issue of the JOURNAL, one recording an interesting clinical case of poliomyelitis, the other emphasizing the importance of diagnosis of the lighter forms of this disease. If, as at present supposed, the wide dissemination of poliomyelitis is due to these unrecognized mild cases and to carriers, their study by general practitioners is of especial urgency since upon their recognition and isolation may depend the safeguarding of large numbers and the prevention of the establishment of new foci in uninfected regions.

## AMPUTATION WITHOUT SKIN FLAPS.

A GREAT war is always replete with experience for surgeons and the present one is no exception. Amputations especially are proportionately much more frequent than they are in times of peace, chiefly because of the prevalence of gangrene, due to the necessity of leaving badly wounded men without surgical aid for days at a time. It is natural then that the technic of amputation should receive careful attention; many surgeons, for instance, advocate plane section on the battle field or at the base hospital with a secondary operation along conventional lines later on when the patient has been removed from the front. The advantages alleged for this procedure are quickness and ease of performance and the avoidance of pockets to fill up with pus. Against this method is urged the experience that soldiers refuse a secondary operation and thus are left with a surgically bad stump.

Another method, which would hardly be sanctioned in normal times, is that of flapless amputation. Writing in the *British Medical Journal* for April, Dr. Fitzmaurice-Kelly describes his experience with this method which he heartily favors. He claims that it saves the maximum length of limb and, in many cases, life itself. He considers this form of treatment absolutely indicated in gangrene, and the method of choice in certain cases of compound and comminuted fractures and in multiple wounds. In cases of gangrene, he says, the entire skin of the limb appears to be unhealthy and when flaps are cut these invariably slough and start a gangrenous process in the stump. On the other hand, if a flapless amputation be done, section can be made just above the gangrenous area, as low as, or lower in fact than, the point where the skin flap is usually started.

Fitzmaurice-Kelly states that there is practically no secondary hemorrhage with this method, that it arrests the spread of infection, and that it can often be done where no other method is possible. The chief disadvantages appear to be the necessity of a second operation, the obvious discomfort and danger of a large, open, granulating surface and the occasional development of ascending neuritis. Even if these objections be valid, the advantages would seem to outweigh them, especially in view of the lack of success of the classical amputation in gangrene so far.



## THE RECORD OF A MEDICAL CLASS.

We have recently received from the secretary of the class of 1911 of the Harvard Medical School a class report, the first which this class has issued. The publication of such reports has not been usual with medical, as it is with academic classes, and its appearance is a matter of considerable interest not only to friends of members, but to those who are glad to watch the progress of their junior colleagues in medicine. There is an excellent preface by the secretary, a statement of the class finances, a class directory, four pages of class statistics and a report of the class dinner held this year. The remainder of the volume consists of a series of brief sketches of the lives of the members, eighty-nine in number. At the close is a map of the United States representing the geographical distribution of the class in practice. Thirty-eight are in Boston or in its vicinity, one is in China, and the remainder are scattered in the north and middle West and along the Pacific Coast. The cordial appreciation and congratulations of the JOURNAL are extended to the class upon this record of its work.

## MEDICAL NOTES.

**THE NEW YORK MORTALITY RATE.**—During the past week one hundred and fifty-two deaths were reported as due to infantile paralysis, as compared with 209 during the previous week and 301 for the week ending August 12th. The epidemic is evidently fast burning itself out. There seems to be every prospect of conditions again reaching normal within the next two weeks. It is encouraging also to note that the mortality of the contagious and diarrhoeal diseases continues to remain lower than during last year. The mortality of the following diseases was lower during the past week than during the corresponding week of last year: measles, whooping cough, typhoid fever, cerebro-spinal meningitis, diarrhoeal diseases, pulmonary tuberculosis and diseases of the nervous system. The total number of deaths reported during the week was 1,388 as compared with 1,515 reported during the previous week, the death rate for the past week being 12.96, as against 14.13 for the week ending August 26th. The death rate for the first thirty-six weeks of 1916 was 14.51 and the death rate for the corresponding period last year, 14.42. In commenting on the figures, Commissioner Emerson pointed out that there was every prospect of having a lower general death rate in New York City this year than ever before. "In view of the outbreak of grip last January, and especially in

view of the 2,000 deaths from infantile paralysis this summer, this is a remarkable showing."

**PREVALENCE OF MALARIA, MENINGITIS, PELLAGRA, SMALLPOX AND TYPHOID FEVER.**—The weekly report of the United States Public Health Service for September 1, states that during the month of July, 1916, there were in Mississippi 21,091 cases of malaria, 1,047 of pellagra and 1,205 of typhoid fever. In Virginia during the same period there were 982 cases of malaria, 16 of cerebro-spinal meningitis, 73 of pellagra and 699 of typhoid. There were 18 cases of meningitis in Ohio, 94 cases of smallpox and 319 of typhoid. There were 85 cases of smallpox in Michigan and 223 of typhoid each in Indiana and Kansas.

**A SULU HOSPITAL SHIP.**—Report from New York on August 17 states that the Philippine Government, in cooperation with the International Health Board of the Rockefeller Foundation, is to send a hospital ship to the Sulu archipelago. These islands are inhabited by about 200,000 Moros and other savage tribes. It is planned to maintain the service of the hospital ship for at least five years.

**CHANGES IN DRUG PRICES.**—Report from New York on September 9 records a few recent changes in the cost of drugs, especially an increase in the price of glycerin.

"A gradual advance is taking place owing to the ever-strengthening position of the crude and dynamite grades which have been practically withdrawn from sale. Another advance of 1 to 1½ cents per pound was named in the chemically pure grades yesterday, the new offering price in drums being 42½ to 43½ cents.

Selling agents for quicksilver have reduced their prices \$4 to \$76 per flask of 75 pounds. This decline is attributed to the favorable settlement of the railway strike.

Peppermint oil continues to advance, \$2.25 being now inside for bulk. An advance to \$1.75 @ \$1.80 has taken place in spearmint in sympathy with the rise in mint oil. Newfoundland cod liver oil is reported materially weaker at \$72 per 30-gallon barrels, a decline of \$3.

## EUROPEAN WAR NOTES.

**PERSONNEL OF HARVARD UNIT.** In the issue of the JOURNAL for August 21 we noted the sailing of another reinforcement for the Harvard Surgical Unit at the front in France. The medical personnel of this unit was as follows:

Dr. Daniel Fiske Jones, Boston; Dr. Lucius C. Kingman, Providence, R. I.; Dr. Samuel W. Jackson, Walldoboro, Me.; Dr. H. and W. Stevens, Cranberry Island, Me.; Dr. Harlow C. Irwin, Wilkesboro, N. C.; Dr. Robert H. Vane, Boston; Dr. Benjamin H. Allen, Ipswich, Mass.; Paul D. White, Boston; Dr. George P. D. Allen,



Boston; Dr. Orland F. Montgomery, Rangeley Lake, Me.; Dr. William A. Frontz, Baltimore.

**APPEAL FOR SERBIAN RELIEF.**—A committee authorized by the French and Serbian Governments, and approved by the Serbian Relief Society, is raising funds to meet the urgent need of support for field hospitals among the Serbian army in Saloniki. This committee has recently issued an appeal based upon the following letter recently received from a French woman in Saloniki.

"Our friend G— and I were considering yesterday in what way we could help the Serbian army, which is now reconstructed and stationed here. . . . They have nothing—less than nothing—and must necessarily have recourse to the French hospitals. It is because of this that I have in my charge the care of the Serbian officers and soldiers. I talked yesterday with the chiefs of their medical service, and their anguish was great, for they have nothing,—neither hospitals, nor ambulances, nor transports, nor automobiles,—and in their intense desire to be again at the frontier of their own country they are asking each other how they will be able to transport their wounded and sick.

England and France already have a heavy burden. The French hospitals here are far from sufficient, and we need so many beds. The personnel is good, but the material necessities are lacking, both beds and ambulances.

I am head nurse in the largest quarantine hospital here (1500 beds), set apart for contagious diseases. We are working day and night now, and the heat is overwhelming, and all the diseases that we dread are spread by it. The overcrowding is great and the Serbian soldiers, who have only a few beds, are scattered here and there.

It is necessary to see this to feel all the horror of it. Even now we are put to the test by the sickness alone of the Allied armies. What will it be when they start fighting?

Please forgive my importunity, for now anything seems permissible and your country is such an immense storehouse and her generosity is incomparable. Consider that all our gold and all our reserve stores have been turned into ammunition, cannon and bullets. Though we are now in the middle of summer the third winter is approaching, bringing with it new sufferings."

Subscriptions towards the maintenance of a hospital for the Serbian army should be sent to the Franco-Serbian Field Hospital of America, 17 West 30th Street, New York City.

**GERMAN ARMY DENTISTRY.**—In the spring of 1916, a meeting of German civilian surgeons and dentists was held in Berlin, at which Surgeon-General Schultzen presented a statement of the organization and work of the German

Army dental service. This statement is abstracted as follows in a recent issue of the *British Medical Journal*:—"The work fell into two main divisions—the treatment of wounds of the jaw, which was the more important, and the everyday treatment of soldiers' teeth, including the making and fitting of artificial teeth, to render the men fit for active service or employment on war duties. The incidence of wounds of the jaw had, he said, far exceeded expectations, with the result that five dentists had to be attached to each army corps, although, under an arrangement made in 1907, only one dentist was provided for each. Dentists were appointed to military hospitals where adequate facilities were provided for skilled work, and were employed also to a certain extent nearer the firing line, when the fighting assumed a stationary character. In fracture of the jaw, the primary object of the dentist was to immobilize the fragments in order that the patient might be sent on at once to a special jaw hospital at home, where extensive operations could be undertaken. About 1,000 dentists were employed by the army on the lines of communication and at home. The organization had worked smoothly. It had been hoped that, owing to the supervision and treatment of school children's teeth, the teeth of the recruit would be found on the whole to be sound. But between the school age and the military age there was evidently time enough for neglect of the teeth to provide plenty of work for the army dentist."

**WAR RELIEF FUNDS.**—On September 15 the totals of the principal New England relief funds for the European War reached the following amounts:—

Secours National Fund	\$210,354.17
French Wounded Fund	118,574.56
French Orphanage Fund	61,875.93
Belgian Tobacco Fund	58,650.00
Surgical Dressings Fund	46,322.37
Prince of Wales Fund	14,731.92

#### MEXICAN NOTES.

**HYGIENIC CONDITIONS IN MEXICO.**—In last week's issue of the *JOURNAL* we noted the relatively low disease and death rates among the United States troops at the Mexican frontier. Report from field headquarters of the American Punitive Expedition in Mexico on August 23, states that during the past five months the members of this expedition have suffered only six deaths from disease. The present sick rate is 1.5, which would be increased to 2.5 if a number of patients treated at the base hospital were added to those in the field. There has been a good deal of amebic dysentery among the soldiers, which was controlled by means of chloride disinfection of the water supply.

On August 23, Dr. Thomas Darlington of New York, representing the National Civic Federa-



tion, made the following report of his recent tour of inspection among the troops at the frontier and in Mexico:

"I have inspected the base hospitals at San Antonio, El Paso, Nogales and Douglas, and have seen the troops in the field. I spent four days at Colona Dublan, headquarters of General Pershing's forces. The camp is most interesting. I don't suppose there will ever be another one like it. To be sure, conditions are not ideal; the flies are pretty thick, but the point is, in Mexico, as along the Border, army officials have done their best for the comfort and health of the men."

There are, at present, sixteen hospitals of the War Department established along the Mexican border. These are already equipped to accommodate 2,500 patients and when completed will have a capacity of 4,500.

**MASSACHUSETTS VOLUNTEER AID FUND.**—On September 16, the total of the Massachusetts Volunteer Aid Association fund for the relief of families of Massachusetts troops at the Mexican frontier reached the amount of \$75,990.15.

#### BOSTON AND NEW ENGLAND.

**WORK AND NEEDS OF CARNEY HOSPITAL.**—A recently published fifty-second annual report of the Carney Hospital records the work and progress of that institution during the past year.

"The number of patients admitted during the year was 3,756; the number discharged, 3,589; died, 153; remaining, 132. The expenses for charity patients were \$16,752.80.

"The Sisters of Charity of St. Vincent de Paul in their report call attention to the desirability of the erection of the south wing, intended in the original plan, but held back because of inadequate means.

"Eighteen cases in the out-patient department and three in the hospital were treated in the radium therapy clinic from its beginning, Dec. 22, 1915, to April 1, 1916.

"Of it the Sisters say: 'Among the movements of 1915 which have been of great interest in bringing us new aids in our efforts to better the condition of suffering humanity, the most important is the gift of radium by Professor M. Douglas Flattery for the establishment of a clinic. Radium treatment, beneficial in many conditions, is rapidly being granted priority over other treatments in the cure of malignant disease.'

"Another contemplated improvement is a Nurses' Home, to be erected opposite the hospital on the site of the three small buildings now occupied by the nurses, yet affording insufficient accommodations."

Dr William H. Devine, president of the staff, calls attention also to the desirability of adding a solarium to the equipment of the Hospital. This could be done by building a series of piazzas

on the south side of the Hospital, each piazza to accommodate thirty patients.

**FLOATING HOSPITAL'S EXCHANGE.**—On a recent trip of the Floating Hospital, stop was made at Bumpkin's Island. The doctors and nurses of the Burrage Hospital and those of the Floating Hospital exchanged places during the stop, those of the Floating Hospital taking charge of the Burrage Hospital and giving up the care of the boat to the doctors and nurses of the island hospital. The Long Island Hospital has invited the Floating Hospital to make a similar exchange with its institution.

**THE WEEK'S DEATH RATE IN BOSTON.**—During the week ending Sept. 16, 1916, there were 216 deaths reported, with a rate of 14.81 per 1000 population, as compared with 234 and a rate of 16.30 for the corresponding week of last year. There were 50 deaths under 1 year, as compared with 57 last year, and 56 deaths over 60 years of age, against 61 last year.

During the week the number of cases of principal reportable diseases were: diphtheria, 29; scarlet fever, 16; whooping cough, 13; measles, 20; typhoid fever, 11; tuberculosis, 54.

Included in the above were the following cases of non-residents: diphtheria, 12; scarlet fever, 1; tuberculosis, 8.

Total deaths from these diseases were: diphtheria, 1; measles, 2; tuberculosis, 20; whooping cough, 2.

Included in the above were the following deaths of non-residents: tuberculosis, 3; whooping cough, 1.

#### Obituaries.

##### EUGENE POTTER STONE, M.D.

DR. EUGENE POTTER STONE, U.S.N., RETIRED, died at North Sutton, N. H., on September 5, 1916. He was a native of Boston and graduated from Harvard Medical School in 1884, entering the navy very soon, and spending his life in the service until he was retired five years ago, because of illness. Just previous to his retirement he was in charge of the naval hospital at Manila. From 1884 until 1890 he was a Fellow of the Massachusetts Medical Society. He is survived by his widow, who was Miss Margaret Grant of Brookline, and by two sons, one of them a student at Harvard Medical School.

##### REUBEN WILLIS, M.D.

DR. REUBEN WILLIS, of South Scituate, Mass., died at the Robert Barr Bridge of Heart Disease, Boston, Mass., September 6, 1916, at the age of 64 years, after a hemorrhage, aged 7 years. He was born in Belchertown, Mass., Sept. 10, 1851, and was the son of Jacob and Sarah (Frost) Willis, and was a private physician in South Scituate, Mass.



Volunteers, in 1861, and saw service in the attack on Roanoke Island and at the Battle of Newbern, being mustered out November 23, 1863. He was graduated from Harvard Medical School in 1867, and practised in Somerville, where he was a member of the staff of the Somerville Hospital. He joined the Massachusetts Medical Society in 1870, and was retired in 1908. He is survived by his widow, who was Miss Eugenia Stowe of Arlington, and by one daughter.

### Miscellany.

#### THE LILIENFELD X-RAY TUBE.\*

IN a recent issue of the *Scientific American* is published a summary of an article in *Die Umschau*, describing a new type of tube for the production of x-rays, named after its inventor, Lilienfeld. Under ordinary circumstances the rays are given off by the metal surface of the anti-cathode under the influence of a bombardment of cathode rays thrown out from the negative pole of a Crookes tube when the latter is discharged by a high tension current.

"The more nearly perfect the vacuum in the tube, the higher tension required for the discharge, and the 'stronger,' or more penetrating, the resulting Roentgen rays. 'Strong' tubes, giving strong rays, are used for taking shadowgraphs of the denser, bony parts of the body; weaker ones, for the less dense tissues. In order to be equipped to meet any case that might arise, the surgeon must keep on hand an array of tubes of different strengths. Nor is that the only disadvantage of the tubes in ordinary use. For any given tube a certain fixed current is proper; and if a stronger (or weaker) current should by accident be used, air passes out (or in) through the walls of the tube and strengthens (or weakens) the vacuum, and hence the tube. To be sure, the original degree of hardness can be restored, but only by a long and complicated process.

The Lilienfeld tube is free from these disadvantages. The vacuum is practically perfect; so it can be used without special preparation. Its operation involves rather more complicated theory than does that of the ordinary tube, but no more care or attention is demanded of the operator. The anti-cathode, which also serves as positive pole, projects from the top. The long narrow central tube contains the Roentgen cathode, bored from end to end parallel to the axis of the tube. Between the negative pole, situated in the obliquely projecting tube below, and the anti-cathode, a high tension is maintained. The discharge of cathode rays is not induced by this current, but takes place in the filament in the lower bulb, which is made incandescent by an auxiliary current. These rays are driven violently upward through the boring

by a high-tension current arranged for the purpose; and their passage making the upper part of the tube conductive, a strong Roentgen discharge then takes place. This accelerates the cathode rays even more, and they fall upon the surface of the anti-cathode with great force, causing the latter to give off the desired rays.

If the current in the auxiliary circuit is increased, more cathode rays will be thrown out by the filament, the tube will conduct better, and the Roentgen rays will be stronger. So that by the manipulation of a resistance switch in the auxiliary circuit, Roentgen rays of any desired strengths may be instantaneously produced, one after another, and employed successively in photographing regions of varying permeability. The extremely high vacuum excludes the possibility of accidental strengthening of the rays through loss of air from the tube. Again, in the new model the primary high tension current does not itself have to make this vacuum conductive, since the filament sends its cathode rays through the entire tube. And on account of the small bore, these fall upon the anti-cathode in a very close, dense bundle, and produce there a tiny bright spot, from which the Roentgen rays are given off sideways, to the left. The close approach of this source of the rays to a single point insures a sharp and finely differentiated negative. In the old apparatus, on the other hand, some of the cathode rays fell upon the glass walls of the tube, heating them to incandescence, so that there was a certain loss of power. Furthermore, the life of the rays is considerably greater in this new device than in the old, making possible longer exposures and photographing of regions heretofore impermeable.

Most notable among the advantages of this new apparatus is the way in which it reduces Roentgen photography to a mechanical operation. By mere adjustment of an indicator on a scale the current is so regulated as to give a sheaf of Roentgen rays of proper strength.

The chief advantages of the Coolidge tube have been experienced in the field of Roentgen therapy; those of the Lilienfeld tube promise to affect rather the field of skiagraphy. Its value and merits must await the determination of experience.

#### DECLINING BIRTH RATES.

IN a recent number of the *Journal of State Medicine*, Sir Thomas Oliver, M.D., of the University of Durham, writes an interesting article on the subject of declining birth rates. He regards as primary influencing causes the emancipation of women and the great change in living conditions during recent years. He states:

"The increasing absorption of young women into spheres of commercial and industrial activity, while tending to lighten the bur-



den of parental obligation, is creating problems which in their final issue concern the future of the race. As effects of the withdrawal of female life into industry, mention may be made of the weakening of the home instincts, a love of independence, and a growing taste for pleasure and excitement, so that if marriage is entered upon, there is a growing unwillingness to accept the duties and responsibilities of motherhood."

During the past thirty years the greatest decline in birth rate among leading countries was in England, which declined 25%. Russia had the least decline, 1%. Between these extremes come Austria, Denmark and Switzerland with 12%, Italy and Finland with 13%, Sweden with 14%, Norway with 16%, Germany with 18%, Holland with 19%, and Belgium and France with 21%. For comparison, the decline in Boston for the past twenty years is 8%. As to increase in population since the Battle of Waterloo, Oliver makes the statement that France has increased one third, Great Britain and Ireland have doubled in numbers, Germany has quadrupled and Finland has increased three times. Italy stands at one-half more and Austria one and one-half. The fluctuations of numbers of inhabitants in Italy are given with Fries as an authority. In 220 B.C. the population numbered twenty-two million, by 2 A.D. it was less than half this figure and decreased to five millions two centuries later. At the beginning of the second Punic war there were 270,000 citizens fit to bear arms, and at the time of Augustus, there was doubt whether 45,000 men could be raised. This reduction took place during a long period of peace, and is an example of a nation which has attained a high position in civilization, and then thrown aside those implements which have enabled her to gain this position.

"A nation's worth," writes Dr. Oliver, "like a nation's hope, rests not necessarily on one class of society, but upon the members of all classes who are thrifty, who are leading normal lives and who are discharging simple duties to the family and to the state."

In this connection it is interesting to note the statements of Professor Walter F. Willeox of Cornell, in the March number of the *Journal of Heredity*. In regard to the decline of both the death and birth rate, he believes that the death rate can and it must be controlled by the education of the people. He does not regard this decline of births, however, as an unmixed evil, for he states that had the birth rate not diminished, the population of Europe would now, but for the war, be increasing faster than the wealth or food supply could maintain it. The unfortunate aspect of the situation is that those strains best qualified to perpetuate themselves, such as college graduates and native American stock, are classes which contribute most to the

declining rate. As a striking example of the present rate of declination of births, he calculates, using the ratio of children to women of child-bearing age, that, should conditions remain precisely the same, in a century and a half there would be no children born. He does not presume, of course, that conditions will remain the same, but makes the statement as an argument for proper consideration of a significant trend of civilization.

## Correspondence.

### HOSPITAL AND GENERAL PRACTITIONER

Mr. Editor:—

One has heard of late statements *ad nauseam* as to the desirability of group-practices, as to the preeminence of modern hospital methods, and the utter futility of the practitioner. Not unnaturally the practitioner has "come back" in rebuttal. But the statements in rebuttal have been protests as to the method of presentation; and as to that only. It is not really important whether photographs of the disputant's family life accompany the article or not; the question is, at the long end of it all, whether he is right or wrong.

My quarrel is with the alleged facts that have been so gaily assumed as premises. It has been asserted (and loudly) that hospitals do work far better than the general practitioner can do. Case for case in the whole community, this may be true. I doubt it a bit, but hope I am wrong, as I try to be proud of my own hospital service. But if this is true, why is it true? Is it because of laboratory facilities, as we are so often told by a man who only recently characterized all urine analyses as useless or needless? Probably not.

Probably if it is true that the hospitals (the public ones) do better work, it is because they make a sincere and rather successful effort to pick the best men in the community for their staff positions. These men work along, year after year, recognizing that the house officer in training is not half so good an assistant as his hospital predecessor (now the surgeon's private assistant); recognizing that Dr. X could, and would, take far better bismuth plates in his own x-ray plant, and that the plates would be filed, not lost; recognizing that nurses in training are not so good as they will be after they are trained; knowing that the externs eke out in a way that would not "get by" outside, but realizing that these folk must learn, while the "Visiting" does the best he can under the handicap.

They do this work partly because of tradition and a vague sense of public duty; partly because of the constant intimate contact with their peers, which so much makes for sanity and balance; partly because the vast experience gained in what we may call the loose wholesale business of a hospital is a great help toward a perspective, hardly to be gained by the more careful and detailed work of a private practice, which must, in the nature of things, be relatively small in those years in which a man's maximum hospital work is done.

After this period, he goes on as with his other fixed habit. If the hospitals turn out better work, it is because they have the best men; not because the hospital system is ideal.

Just now a nation-wide movement of standardization is showing some signs of success. This is not because the country is becoming more homogeneous, but because we have had a chance for a few years to rate efficiency with regard to the treatment of



accidents. Do the big hospitals show up in the lead? I throw not; very much not!

Best of all are the "company hospitals" of the big industrial plants. Worst of all is the untrained practitioner; poorly equipped because of poor pay. So far as I can get the facts, most of the reasonably successful practitioners show up about level with the good hospitals in results.

Let us not forget that the "G. I." has an x-ray man who does better work in the office afternoons than at the hospital of a morning; that he can always get interested advice from a medical or surgical colleague, or a nerve sharp, or a skin specialist, or what not, at any time, even for the patient who cannot pay a cent, and that this colleague will do better work on a case so referred than he does (however good his intentions) on a routine case pushed into the routine of his clinic.

One cannot quite organize any professional service; least of all that service of medicine which has from time immemorial been personal, altruistic and interested.

The doctor must be paid; he spends like another; wants as much money, but after all you cannot quite buy a doctor! His best work is where his heart is, and pay has little to do with it.

I am afraid that as time goes on, there is danger that medical care of the citizen is going to become a function of the State, but there is some comfort in the fact that we of this generation are not likely to live to see this development interfere seriously with our own work in the profession we have grown up in.

One other point, and I am done.

In this social or sociological scheming for the uprooting of medical practice, much has been made of the successful experiments of certain universities in the care of their students. Does it not occur instantly to any thinking man, that what can be done—has been done—at certain Western universities, namely, care at \$5.00 (or whatever it may not up) for the year, is absolutely valueless in arguing as to the medical care of a mixed community? Not only are the students at the age of maximum vigor, maximum interest in active affairs, minimum morbidity, but they are a picked class as well; the very best of our population. More than this, they are exempt from want, exempt from the strain and risk of industry, and exempt (or nearly so) from the great load of alcoholism and social vice. What can one argue from such a community as to what can be done in one of our big cities?

If we are to plan for the "socialization" of our profession, is it not time for us to look to men who can think in broad terms; who are fit to be leaders in a broad consideration—not of theories but of conditions, as they are; who can plan for the future, not for Utopia?

Changes in medical practice are sure to come; probably rather rapidly. Should we not plan to meet them by consideration of facts, as they are, not as they might be?

Very truly yours,

FREDERIC J. CORTON, M.D.

Boston, August 9, 1916.

P. S.: By the way, there may be some of your readers who mistake all this recent stuff for original thinking.

They should be disillusioned and referred to the long prologue of "The Doctor's Dilemma" by a wonderfully whimsical, clever, witty and mainly wise Irishman, named Shaw, who writes wonderful English to express rare sense and rarer nonsense. Perhaps he is right; perhaps (as I think "mine own self" a half right; but Bernard Shaw did the only real thinking involved in this medico-sociological problem.

This relation of thought to headlines seems not unusual.

F. J. C.

## BETTER DOCTORING FOR LESS MONEY.

Boston, Mass., Aug. 14, 1916.

Mr. Editor: I have been interested in the discussion in your columns of "Better Doctoring for Less Money," and have, therefore, read with care that contribution. I am reminded of the homely saying of one of our native philosophers: "It's better not to know so much than it is to know so many things that ain't so."

It must be a matter of regret that the writer of the article in question chose to express his opinion in such an infelicitous manner. Here and there is a suggestion of irony, to be sure, as in "the state of things which I have described—I believe without exaggeration." But whether it be satire or something else, it is to be taken seriously and it is a fair question to ask what the author is trying to say.

It is unfortunate that attention has been so diverted by the misrepresentation on the part of the author, perhaps *gaucherie* is a more accurate term, that his main point, as I see it, seems to have been missed by some of the critics.

The writer believes, as I understand him, that co-operation among physicians, by the group system, in connection with hospitals, will solve the problem of bringing to all who are sick the best medical art of today at a cost which any can pay. Stated thus concisely, it is easy to see that not all can have the best, and the problem is not the same in rural as in the urban communities.

There is some such problem before the medical profession today. Its solution is not yet clear. Perhaps the group system, in reality widely spread at present, may be of some assistance if it is more formally and extensively applied, and linked with hospitals. That this alone will suffice is questionable.

Now many other problems are touched upon in the original article and in the rejoinders. It would take too much of your time for me to specify all the errors, inaccuracies and misrepresentations. Scarcely a paragraph is above criticism. The comparison of students, picked young men and women, with the clientele of a general practitioner is illuminating. I am inclined to think that at a university clinic there would be little material for the departments of obstetrics, gynecology, pediatrics and genito-urinary diseases, for example, which constitute an important part of the interests of the man in general practice. Then, too, the diseases of the "degenerative" type, common after fifty, one would hardly expect to see. Is it true, I wonder, that at the University of California suspected early disease is real, at Harvard imaginary?

In the closing section, on the financial temptations of doctors in private practice, the author has demeaned himself unworthily. His arraignment of the medical profession is unjust. Is it not more nearly true to say that it is one of the glories of the medical profession that physicians spend their lives in preventing disease and curing the sick, trying to accomplish that which, if successful, would take away their livelihood?

But my object in writing is to call attention to the fact that we seem to be forgetting ourselves. Why this acrimony of discussion? The specialist is not a recent development. Before the times of the Father of Medicine, there were specialists among the Egyptians, and probably there will be specialists for some time to come. I am inclined to think the general practitioner will fortunately always be with us, not however, because he is poor. It will be a sorry day when society is so organized that there is no longer a place for such a man as the Doctor of the Old School.

We sometimes think of the specialist as one who charges special, that is high prices, not one who, having special knowledge and skill, renders special service in the art of medicine. It is the specialist on whom chiefly falls the burden of advancing knowledge



in both the art and the science of medicine, and his is the corresponding joy. This duty of the specialist is too often forgotten.

There are faults on the part of some specialists and on the part of some general practitioners. Whether the faults will be affected by the new era I do not know. Some physicians in general practice are ignorant, unscrupulous, dishonest, criminal. Well, so are some specialists. So are some lawyers. Some men and some women are unfaithful to their marriage vows. Shall therefore the marriage vows be relegated to the limbo of outgrown and harmful superstitions?

The problems arising from the growth of specialism, the progress in medical knowledge, the concentration of population in large urban communities, and the tendency toward socialization of many activities within the state, are problems which concern all of us, which we must all face and to solve which we must all do our part.

Efficiency is the cry of today. It is not new. "Whatsoever thy hand findeth to do, do it with thy might, for there is no work nor device nor knowledge nor wisdom in the grave where thou goest." But efficiency in itself is not what we want. A machine that makes an automobile a minute may be efficient in one sense of the word, but if it is telescopes that are wanted, "it cumbereth the ground." So the general practitioner is relatively inefficient in making very exact physical diagnoses, dispensing drugs, keeping elaborate records, compiling statistics, even in performing delicate and difficult operations, of which there are really some in modern surgery. But we find him very efficient in ministering to some of the needs of his people, for these often love their family doctor and look upon him as their friend. I wonder at times if a reason why some of the members of the medical profession are not looked up to as were our grandfathers, is not because we have not as much real manhood as they possessed. We know more about leucocytes and phagocytes, toxins and antitoxins, Widal's and Wassermann's, but are ignorant of the weightier matters of the law which made them towers of strength in their communities.

I do not mean even to suggest the solution of the many problems confronting the medical profession today. The solution is not easy. I am quite sure, however, that it is not true, as the writer of a Question of Medical Ethics says, "if we worked in harmony more and talked harmony less, advance in medical progress would be assured and unobstructed." For lack of harmony is not the only obstruction to advance in medical progress. But it is true that when "we put aside petty jealousies and work together for the common good," we have made a beginning in the right spirit, the spirit which does actuate most of the men in the profession. And medicine is a profession; it is not an industry or a trade. But to this right spirit must be added intelligence, honesty, love of justice, forbearance, and loyalty to high ideals, which means determination to make them real.

Yours very truly,  
STEPHEN RUSHMORE, M.D.

## THE FUTURE OF BLINDED SOLDIERS

(From Our Special Foreign Correspondent.)

LONDON, JULY 16, 1916

### ST. DUNSTAN'S HOSTEL FOR BLINDED SOLDIERS AND SAILORS.

Mr. Editor: A great work is being carried on by the National Institute for the Blind. Sir Arthur Pearson, President and Honorary Treasurer of the Society, is himself blind, and has organized a "house of good comfort" for blinded sailors and soldiers. A house and extensive grounds in Regent's Park were

turned over to the institute through the generosity of Mr. Otto Kahn, an American, and in March, 1915, these premises became St. Dunstan's Institute for the Blinded Soldiers and Sailors.

At the end of the first year, in March, 1916, there were at the hostel, or in the annexes at the sea-shore, 140 non-commissioned officers and men. St. Dunstan's is a "workshop of darkness," differing from other institutes for the blind in that those who enter were, not many months before, strong men, possessed of their full powers.

As I approached Regent's Park I met two blind men. They had come to a crossing on a busy street and hesitated. A passerby stepped up and piloted them across and the two passed on down the side-walk as though much at home. I entered the park and turned up the driveway to St. Dunstan's. There seemed to be no able-bodied men about, but one grows used to that in these times. Even the lodge-keeper was one-eyed. The hostel was apparently filled with young ladies in Red Cross uniforms or dressed in simple white. None of the blinded was in sight, but as I walked out to the gardens one entered whistling cheerily. He passed through the room, following the strip of carpet laid as a pathway through the building. A young lady acted as my guide, and we proceeded to the workshops scattered about on the lawn, which sloped gently down to Regent's Park Lake. We entered a hut where a dozen or more men were being taught to read and write Braille, which, I believe, they pick up in a surprisingly short time. The alphabet is the same as that used in America, but the abbreviations are quite different. They write with machines resembling small, two-faced typewriters, which punch out the letters on strips of stiff paper. The teachers are women who come in each morning for this voluntary work. A small class was learning typewriting, and I was told that a number had secured good positions as stenographers.

At the sound of my guide's voice several of the men cried out, "Oh, Miss , will you save me a dance tonight?" It seems that, in addition to other entertainments, dances are held once or twice a week, and all the men are instructed in the terpsichorean art.

We passed an open window and stopped to look in on a group of men gathered about a table. One was reciting an accurate description of the surfaces and borders of the clavicle, while the others followed by fingering specimens of the bone. This was an anatomy class for those who wished to become masseurs. The blind have had considerable success with massage. One of the men from St. Dunstan's recently took the first place in the examinations given by the Incorporated Society of Trained Masseurs, against 180 competitors. Others are doing massage now in military and civilian hospitals. We entered the workshops. Here was a perfect babel of noise. Singing and whistling were punctuated by the rapping of many hammers. One section was making shoes, and very good work they did. Another was carpentering, and their instructor, also blind, passed by my from bench to bench. The joints they made were excellent. Some worked at mats, others wore hats, coats or nets. I was told that a number had left the telephony, and were now doing the work of contractors in a satisfactory manner. Others had become as trained gardeners.

The institute publishes, month for the blind and also a weekly edition of the *Daily Mail* that, due to the generosity of Lord Northcliffe, the men seemed surprisingly busy and happy. The fact, one might travel a long way before finding a substitute of this nature which is pervaded with such a cheerful atmosphere. Not the whole day is spent in work. In each afternoon they take a tea-break, relax, and many spend their time reading or conversing.

ST. GEORGE'S, JULY 16, 1916.  
W. G. P.



## LIGHTER FORMS OF POLIOMYELITIS.

*Mr. Editor:—*

Several cases that have come under my observation during the past two or three weeks lead me to the inference that some of the men in a position of more or less official authority in this State in connection with the present epidemic of poliomyelitis are not conversant with the lighter forms of this disease. If we may reason from analogy with other infectious diseases, it would seem as important to recognize and isolate the light forms of poliomyelitis as it is to subject the more pronounced cases to a strict quarantine. The failure to do so offers a menace to the community really greater than the unrestricted freedom of a well pronounced instance of the disease, for in the latter instance a brief period of relative isolation is naturally enforced by the victim's more or less helpless condition.

The fact that seems not recognized by those responsible for the enforcement of quarantine is that absolute paralysis of muscles or muscle groups is not necessary for the diagnosis of anterior poliomyelitis. Many years of observation, previous to the present epidemic, at a large clinic in this city where many cases of this disease are seen every year, has demonstrated the fact that instances occur in which after an onset of typical character, with vomiting, fever, constipation and malaise, the child is left without absolute paralysis of any muscle or muscle-group, but with relative weakness of some muscle or group of muscles, and with loss of the deep tendon reflexes corresponding to or in the vicinity of the parietic muscles.

These cases must be considered as instances of anterior poliomyelitis. No other diagnosis is justified, and, so far as we know, the victim of such a symptom-complex is just as much a menace to the community as the victim with complete paralysis of an extremity. The extent and severity of the disease in any one individual is probably a matter largely of relative individual immunity. If we admit at all the contagiousness of this disease, we must recognize that, as in the case of diphtheria, a light instance in one child may transmit to some other child a more malignant type of the disease.

Physicians in responsible positions in hospitals or in health departments may be pardoned in failing to recognize abortive forms of this affection without sequelae, but it does not seem so excusable to ignore, during an epidemic, cases with conspicuous onset followed by the residual of relative muscular weakness and abolition of the deep tendon reflexes, especially when this is conspicuous in one limb when compared with perfectly normal conditions in the opposite extremity.

Another variety of this disease that does not appear to be readily recognized is that which takes the form of acute encephalitis without nuclear involvement, either bulbar or spinal. I had thought that the long disputed claims of Strumpell had for some years been recognized as valid, but I was surprised to find recently that reluctance existed in a certain Boston hospital to accepting the identity of the two forms of infection, nuclear and cerebral. Not only do we have cases, during epidemics of anterior poliomyelitis, with purely cerebral symptoms, but such instances may on autopsy present no macroscopic explanation of the cause of the symptoms or the reason for the fatal termination, these being revealed only by careful and extended microscopic examination. These are instances in which the process is of focal character, and more or less limited in extent. They may not be accompanied by any localizing symptoms during life, but they are often characterized by hemiplegia or monoplegia, of course of the spastic type. They are frequently of very acute onset with a sharp rise of temperature, which, however, does not subsequently present any particular curve, and often soon falls to or near the normal level. In children, the convulsions that sometimes accompany the affection are

frequently attributed to errors in diet or to some such irrelevant cause.

Under present circumstances I feel that attention should be called to the above facts, and I trust you will lend your columns to their publication.

Very sincerely yours,

ARTHUR W. FAIRBANKS, M.D.

591 Beacon Street, Boston, September 6, 1916.

## A CASE OF POLIOMYELITIS.

*Mr. Editor:—*

The following brief account of a case of acute anterior poliomyelitis may be of interest on account of the age of the patient.

A man, sixty years and eleven months of age, awoke Thursday morning, Aug. 17, at about five o'clock, feeling sick. He ate little breakfast, but went to his work as a carpenter. He had such severe pain in his shoulder blades, shoulders and extending down the outer side of his upper arms and he had to leave work and go home at eleven o'clock. He was very restless during the afternoon, and sent for me in the early evening. The pain, which he described as "horrible," was not affected by movements of his arms, which he could make freely in all directions. There was a slight retraction of the head as he lay in bed, and some resistance to flexion of the neck, although he could rotate the head without difficulty. He was extremely restless, continually getting in and out of bed, and occasionally walking to the bathroom. The temperature was 101°; pulse, 90.

My suspicion was aroused by the severity of the pain, the indefiniteness of its location, and the fact that it was not affected by movements; by the slight rigidity of the neck, and the rise of temperature. During the next day he was much as he had been on the day before, although he was in somewhat less pain, and the stiffness of his neck was rather more marked; he was still very restless. The temperature continued about 100°. In the late afternoon he could not raise his left arm quite so readily as the right.

Saturday morning both arms were paralyzed, although he could move his fingers a very little; his breathing was entirely abdominal, and he choked when he tried to swallow. He died at 7 p.m., about two and a half days after the onset of the disease, from paralysis of the muscles of respiration. He was conscious until his death, which occurred suddenly as he was being helped from a chair to the bed.

The autopsy, on Sunday, showed no gross appearances of disturbance of the cord, but microscopic sections, made by Dr. Mallory, showed typical signs of poliomyelitis.

The points of special interest to me were the age of the patient and the fact, known to pathologists but not, I believe, to the average practitioner, that the cord lesions may not be apparent except on microscopic examination.

Milton, Mass., Aug. 26, 1916.

M. V. PIERCE, M.D.

## BELGIAN PHYSICIANS' RELIEF FUND.

REPORT OF THE TREASURER OF THE COMMITTEE OF AMERICAN PHYSICIANS FOR THE AID OF THE BELGIAN PROFESSION, FOR THE MONTH OF AUGUST, 1916.

No contributions for the month of August.

Previously reported receipts ..... \$7,946.86

Previously reported disbursements:—

1,625 std. boxes food @	\$2.20	\$3,575.00
1,274 std. boxes food @	2.30	2,930.20
353 std. boxes food @	2.28	\$804.84
Total disbursements .....		\$7,310.04

Balance ..... \$ 636.82

F. F. STIMPSON, M.D., Treasurer,  
704 S Jenkins Arcade Bldg, Pittsburgh, Pa.



# The Boston Medical and Surgical Journal

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## Massachusetts Medical Society.

### PAPERS AND DISCUSSIONS OF THE SECTION OF SURGERY, JUNE 6, 1916.

#### SYMPOSIUM ON FRACTURES.

##### THE IMPORTANCE OF EARLY REDUCTION OF FRACTURES WITH DISPLACEMENT.

By WILLIAM DARRACH, A.M., M.D., NEW YORK CITY.

So many bad results of fractures can be attributed to delay in reduction, and so many excellent results are obtained in fractures without displacement, that this topic seems worthy of attention. The end-results usually obtained in fractures without displacement show what may be accomplished by immediate reduction.

Let us look at the question from a pathological viewpoint. It is well, perhaps, to dissociate the lesions of the fracture itself from those of the associated injuries. By the former is meant the injury to the bone with its periosteum, endosteum and blood-vessels. Under the latter are included the coincident injuries to the adjacent structures. The relative importance of the two varies widely and may well affect our procedures. In fractures of the skull and spine, the associated injury to brain or cord, whether from displaced fragments or from subsequent hemorrhage, will far outweigh the bone lesion itself. In fractures of the pelvis the associated visceral injuries may be of prime importance.

We are dealing first with a break in the bone

and a displacement of the fragments. The periosteum is torn and stripped to a varying degree from its bony attachment. There is a rupture of blood-vessels. With the ensuing hemorrhage there may be additional stripping of periosteum. Soon, very soon, the blood coagulates and the fibrin network forms. Then follows the cellular proliferation and the organization of the clot. The early repair is like that in any wound in connective tissue, but after a few days special changes characteristic of bone repair appear, and the so-called osteoid tissue is seen. In a specimen removed at operation three days after injury the suggestion of osteoid tissue was surprisingly strong. If we turn back to what is going on in the tissues adjacent to the site of fracture we will find a varying amount of laceration of soft parts; hemorrhage advancing into the muscles, tendon sheaths, ligaments and perhaps joint cavities and along fascial planes and nerves. Following this and in a wavelike manner comes the boggy, edematous infiltration of the soft parts, the time and extent of which is clearly demonstrated by the external signs of swelling and ecchymosis. The lesser the mobility and elasticity of these tissues must impede the ease of reduction. The ideal time for reduction is immediately after the injury, and if this could be accomplished, the retraction from the bone ends would be greatly diminished. With reduction at hand, the reparative tissue formed with the fragments in their normal position will find it easier to take its proper place after reduction has been accomplished; the farther the fragments are from their normal position, the greater the difficulty.



struction; also the denser this new tissue is, the more it will interfere with the exact readjustment of the fractured surfaces. Nature begins her attempts at repair immediately and does not wait for us to reduce the displacement.

The following statements I believe to be facts:

A more exact replacement can be accomplished in the first few hours than if the reduction be delayed, especially if that delay be a matter of days.

The percentage of perfect anatomical results will be much higher with early reduction.

The ease of reduction to a large extent will vary inversely with the time elapsed since the injury.

The additional trauma caused by manipulations during reduction will be reduced.

The evil effects of pressure of a displaced fragment on adjacent structures will depend on the duration, as well as the amount of that pressure.

With a more perfect reduction comes a decrease in the amount of new tissue necessary to repair the injury, which means a lessening of the period of disability and a more complete return of function.

Lastly, the amount of pain and discomfort subsequent to the reduction will be lessened.

Shall we wait for an x-ray? It must be accepted that with a proper x-ray examination (and that includes always views in two planes, better stereoscopic and best of all with the aid of the fluoroscope) a more perfect reduction can be accomplished with less additional trauma than if it is done blindly. Whenever such an examination can be made within an hour or so of the injury, I believe we should wait for it. But if we must delay over night, or over Sunday, it is wiser to proceed without the aid of such examination. The differences between the two-hour reductions and the twelve-hour reductions are not very great, but after forty-eight hours the difference is marked, and to be able to make a second attempt within the plausible time is a strong reason for the immediate attempt. My preceding remarks apply to the closed reduction of fractures and not to the open method. The problem in open reductions differs in two respects; first, we are able at operation to remove the tissue interposed between the fragments in the early days of repair, and so to obtain a more exact replacement; and, second, a new factor is introduced, namely, infection. To combat better the latter we should wait for a few days until the body has had a chance to recover from the stunning of the original injury, before we add a second trauma; until the army of defense has had a chance to mobilize, and the war zone has been properly entrenched against the invading bacterial hosts. But this delay should not be overlong, as those of you who are doing open work well know the difficulty of obtaining and maintaining reposition where the dentations have been filled with

tissue hard enough to need the chisel, or where sharp margins have been rounded off so as to blur the landmarks. In this same connection many cases now requiring open reduction would never come to the operating table had proper attempts been made on the day of injury.

To quote from a former paper, "That odious dictum, 'wait till the swelling goes down,' is responsible for more permanent deformities and lasting disabilities than its author should care to contemplate."

Therefore, gentlemen, if there be any truth in what I have said, may I draw the following conclusions?

That our hospitals should be so equipped that the x-ray plant is available at any hour of the day or night, including Sundays and holidays.

That fractures should be considered in the same emergency class with ruptured ulcer and acute appendicitis.

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### THE TREATMENT OF HIP FRACTURES.

By F. J. COTTON, M.D., F.A.C.S., BOSTON.

THE best way to be sure of satisfactory results in hip fractures is to have a system and a conviction; that makes it unnecessary to look up results.

A year ago a surgeon of deserved international reputation told me that if I would only use the Maxwell method always, I should never have any trouble with hip fractures; he never did. And he believed it!

The fact is the results are wretched. The unavoidable mortality is not small; the proportion of permanent cripples (total or partial), judging by data from Scudder and others, as well as my own, will run over 50% in any hospital series, and the private cases not much better.

When one comes to study cases and results in any number, it is obvious that there are two classes,—the trochanteric and the subcapital (probably better terms than the older extra- and intra-capsular). The two classes divide sharply; in the trochanteric it is a question of position only; in the subcapital, we have not only position to consider, but a very real question—whether bony union or really close fibrous union is going to occur at all. This is due partly to the poor nutrition of the separated head; partly to the interfering presence of synovial fluid.

And the risk of non-union is not only in fractures loose from the time of injury, but also in those apparently impacted, as shall presently be shown.

Now as to the trochanteric cases. First as to types (Fig. 1). Now there is no question about union in these cases; they unite by massive callus—usually promptly. The





FIG. 1. Types of extracapsular hip fracture. Nearly three-fourths of the cases of this type A, and nearly all the cases of this type B. The lesser trochanter split off as a separate fragment. Note the coxa vara deformity in both A and B.

question is purely one of deformity. There is apt to be outward rotation, easily taken care of, but the real deformity is a coxa vara type; an increase in the angle of the neck with the shaft (Fig. 2). With this goes a ten-

Now, everyone has been claiming everything for his pet method in *all* hip fractures.

I have tried to attack the problem of failure of bony union in subcapital fractures. I am going to try to give an idea of the reality of



FIG. 2. Extracapsular fracture, obli. united. C, coxa vara deformity.

dency to adduction contracture, muscle shortening, common to all hip injuries. Any treatment that ensures a reasonable amount of abduction is adequate for this class.

The Maxwell method works; the Whitman method works; and of late I have been trying Moore's scheme of a double spica in flexion and abduction, in which patients can be sat up erect,—a method of advantage in feebler patients, and of real comfort. This works, and I understand Binnie's method of sitting them up without apparatus gives good results, though I have not used it. One doesn't need *forced* abduction; simply the prevention of adduction deformity, that's all. (Fig. 3.)

The subcapital breaks, on the other hand, are essentially intracapsular, and therefore have no massive callus. Some are impacted in the beginning, and if they stay impacted, they unite by bone, slowly. If they start loose, or work loose, they do not unite by bone, and produce cripples,

this problem; of the frequency of failure along conventional lines; then to speak of my attempts.

There are, of course, some cases in which there never was any impaction (Fig. 3, B).



others, not impacted, but still, in my opinion, not adequately impacted. These cases, I believe, all require external fixation, and I have seen rare failures of bony union in these cases.





FIG. 5. A, Fresh neck fracture—hardly more than a crack.  
B, Same, forty-four days later. Note absorption of length of femoral neck without loosening of bony contact.

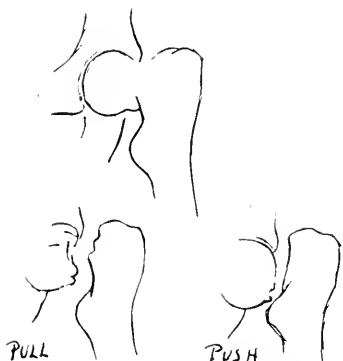


FIG. 6. A, Accidental impaction. This loosened without fresh accident.  
B, Pull; C, Push, taken five months later, showing what happened in the end. A wretched clinical result.

5). During this stage, or later, many a hip falls apart (Fig. 6).

My idea was to secure to the loose fractures the advantage of impaction; to re-impact those that needed correction; to fix them all in a



FIG. 7. Two end-results of artificial impaction.

A is the x-ray taken at 10 months.  
B was taken at 15 months.  
Both these patients walk without a limp. Both were shown in October before the Clinical Congress.

moderate abduction. This I have done for some six years, in about thirty cases.

The method has been of hammer impaction (after reduction) and a plaster spica. No harm has resulted in any case. The plates show some of the results (Figs. 7, 8, 9, 10.).



FIG. 10. Loose fracture. Mallet impaction. Figure to the right shows condition six weeks later. Is now beginning to walk.

It is my contention that these results are encouraging; that no one has shown better results in intracapsular cases.

The other cases do not strike me as worth quarreling about; they do well under any careful treatment. The question is: Is this the best way to treat this class; the unimpacted or poorly impacted subcapital fractures; the ones that have in the past given such lamentable results, even in competent hands?



FIG. 8. Artificial impaction. A, Before; B, After; C, Three months later. At six months has not over five-eighths inch shortening and promises an excellent result.



FIG. 9. Case of loose neck fracture operated on at the Peter Bent Brigham Hospital. Courtesy of Dr. Harvey Cushing.  
A, Before impaction. Impacted with mallet in usual way.  
B, Shows result two weeks later. (From x-ray through plaster spica.)  
C, Taken four months later.



# CERTAIN FACTS CONCERNING THE OPERATIVE TREATMENT OF FRACTURE OF THE PATELLA.

BY CHARLES L. SCUDDER, M.D., BOSTON,  
AND  
RICHARD H. MILLER, M.D., BOSTON.

THE method followed in the operative treatment of fractures of the patella at the Massachusetts General Hospital by the staff as a whole has been essentially uniform. This operative method has consisted in approaching the joint through an ample incision, removing gently all easily obtainable blood clot, freshening the bony surfaces of the fracture, approximating the fragments by manual pressure, suturing the capsule and torn fascia with chromic catgut, closing the skin wound, immobilizing the knee for a few weeks, allowing the patient to walk with the knee still immobilized, and in using active motion and massage early after operation. It occurred to us to study these cases of fracture of the patella thus treated by operation in order to determine, if possible, whether the method of treatment, so generally used in the clinic, is really satisfactory. If the method is not satisfactory, to determine in what particulars it is unsatisfactory, and how the treatment can be improved.

This paper is based upon the studies of a series of consecutive and unselected cases from this same clinic, which were very carefully examined, and x-rays of each case were taken by Dr. Walter Dodd and Dr. George Holmes.

Fractures of the patella treated by non-operative methods ordinarily result in ligamentous union. Ligamentous union occurs because of an absence of bony contact of the fragments. The securing of bony contact, or complete reduction of the fracture of the patella, is usually impossible by non-operative methods, because the lacerated fascia and soft parts drop between the fragments as curtains of interposing soft tissue. Moreover, by the non-operative treatment the bony fragments cannot be approximated satisfactorily if there is extensive tearing of the lateral fascia and capsule of the knee joint, which very frequently occurs.

In the operative treatment of fractures of the patella, it is desirable to avoid non-absorbable suture material whenever possible. The end to be sought in fracture of the patella is a perfect anatomical result, despite the fact that certain cases with ligamentous union have had functionally useful knees.

In this series there are two facts which stand out prominently. First, 81% of the cases have demonstrated bony union of the patella following the use of the absorbable suture combined with digital and suture approximation. This means that there is 19% of failures in securing bony union. The fracture is not reduced in 19% of the cases.

Letters were written to all cases of fracture of the patella operated upon during the

past few years. Combining those patients who reported in person and were examined, with those who simply answered letters, there were 38 cases in all. Full extension in motion at the knee joint was reported in 94% of the cases, full flexion in 60.5%, and full extension and flexion in 57% ; 63% of the cases reported that they were able to work as well as before the injury.

Twenty-two cases were x-rayed, showing the condition of the patella following operation at the end of one year or more. Complete bony union existed in 81%. Of these, 18% had union only by a bridge of bone; 18% had absolutely no bony union. All of these cases, save one in which wire was used, were sutured with silk, catgut or kangaroo tendon. In the case sutured with wire, the wire broke and there was no bony union. Surprisingly good functional results were found in the cases with no bony union.

It is evident that digital approximation of fragments and suture of the soft parts does not bring the bony fragments accurately into apposition in all cases and does not maintain such apposition. Bony apposition can be secured, we believe, by using some method of accurately approximating the patellar fragments. This can be accomplished by the clamp devised by one of us (C. L. S.), and which will be reported later in detail. It is not proposed to use this clamp in all cases, but only in such cases as cannot be reduced accurately without it. It is a means to an end in a few patellar fractures, and, of course, can be utilized in old, ununited fractures with great separation of fragments.

In this series of cases it was apparent that the functional disability most evident is the very considerable limitation of flexion of the knee; 39.5% of the cases had less than full flexion. How can we increase the number of cases having full flexion?

There are evidently several factors influencing the restoration of the joint to normal motion. One of the important factors, and the one we are particularly concerned with at this moment, is the preservation of the anatomical patellar surfaces. If the bony surfaces of the patella are restored to normal, then one of the causes of the functional disability will have been removed.

From this study of the series of cases occurring in this hospital, clinic we have come to the conclusion that in order to secure the results of the operative treatment of patellar fractures we must try to secure bony union. Bony union through the use of the absorbable suture combined with digital and suture approximation of the fragments of the bone is not always obtainable. We must use a clamp to accurately approximate the fragments, and we must use a suture which will maintain the position of the fragments. Wire or kangaroo tendon is not a suture which will maintain the position of the fragments in all cases as well as the absorbable suture.



the fragments, the patellar clamp may be employed with gratifying results.

After the reading of this paper, Dr. Miller demonstrated by lantern slides certain of the facts brought out in the paper, giving the details of the cases referred to in the lantern slides.



#### SOME ASPECTS OF THE TREATMENT OF COMPOUND FRACTURES UNDER CIVIL AND MILITARY CONDITIONS.

By DAVID CHEEVER, M.D., BOSTON.

ONE must be an optimist indeed who hopes and believes that out of the brutal chaos of the present war may come some good to suffering humanity; yet we doctors may dare to indulge in optimism, for surely, from the unprecedented experience and mass of data now being accumulated by the surgeons of the warring nations, progress is certain to be made in the control and prevention of disease. Sanitation, the extermination of flies, lice, mosquitoes and other intermediate hosts of infection, the prophylaxis of epidemic disease by vaccination or inoculation, the study of the control of infection in wounds, the healing of wounds, advances in the knowledge of the physiology of various organs, especially the central nervous, the cardio-respiratory and the digestive systems, gained by opportunities for observation offered by the traumas of warfare, are examples of fields where progress is already recorded. Among the special problems, few are more pressing than those presented by compound fractures, the treatment of which in warfare is sadly lacking in authoritative standardization, though doubtless in civil practice much more uniformity exists.

Simple fractures (excluding fractures of the skull) present chiefly the largely mechanical problem of the promotion of repair of various parts of the skeleton, and to a less extent the combating of shock or the conditions which may attend the enforced invalidism of the patient; compound fractures present the possibility of a much greater degree of shock (perhaps associated with hemorrhage) and the problem of wound infection. This latter condition, with its attendant possibility of death, must take precedence in its demands over all other considerations of treatment, for methods, however skilful in fixation and immobilization, which do not yield precedence to the proper primary and subsequent treatment of the wound, are almost sure to result in disaster. Fortunately, in most instances, the two objects are not incompatible, though some afford the most perplexing and baffling difficulties with which surgeons have to deal.

Only those whose experience or recollections

go back to the pre-Listerian days can have any graphic conception of the miracle wrought by antiseptics. Then such an injury meant the serious consideration of amputation as a primary measure, or resort to it, sometimes too tardily, during the course of the case; now the expectation is justified that a compound fracture will do well. In civil practice, such an injury presents usually but trivial difficulties, compared with those under conditions of warfare. Commminution of the bone is absent or moderate in degree; the wound is apt to be small and the soft tissues not devitalized by trauma; the infection from skin, clothing or soil may be of a slightly virulent type; prompt treatment and disinfecting measures are applied before the infecting organisms have time to multiply; the prompt arrival of aid (in civilized communities) minimizes shock from hemorrhage, pain, exposure and hunger, and the problems of transportation are usually not significant. The treatment of these conditions (except as relates to wound disinfection) is so generally standardized that but few suggestions may be offered. First, in cases presenting a comparatively small wound, where the bone-end, after perforating the skin, has retreated to its normal bed, it is usually wiser not to enlarge, explore, and disinfect the wound, but to assume that serious infection has not taken place, and keep careful watch for its appearance. My own practice is to seal temporarily the wound with sterile gauze, while the surrounding field is cleaned with soap, water, alcohol and some disinfectant solution, touch the edges of the wound with iodine, insert a very shallow gutta-percha-tissue drain, and apply a wet antiseptic dressing of hypochlorous acid or bichloride of mercury (the biniodide may be better since it is said not to coagulate albuminous fluids). If infection is present. Nature, here, as elsewhere, will probably succeed in localizing it under the favorable conditions surrounding our patient, and close observation will give ample warning for interference to be effective. I feel certain that the routine exploration of these small wounds and the applying of gross efforts at disinfection with swabs and scrubbing brushes, do more harm than good. The second suggestion that I offer is that means of internal fixation, especially bone-plates, are by no means contraindicated by the infection of wounds of compound fractures. In such lesions of bones near the surface, such as the tibia, ulna, radius, humerus and clavicle, where satisfactory position cannot be obtained by external splints, which afford free access to the wound for purposes of dressing, bone plates may be applied as temporary internal splints, intended to be removed when union in good position is assured, usually three or four weeks. The external splinting and dressing of the wound is thus enormously simplified. The wound should be packed open by gauze within gutta-percha tis-



sue, and dressed, when necessary, with scrupulous care. In spite of the packing, the tissues sometimes will heal completely over the plate. No anesthetic (save possibly a little novocaine infiltration) is required for its removal. The writer has thus plated, without untoward results, the tibia, ulna, radius and clavicle. The humerus should usually be susceptible to the same treatment. The deep position of the femur may contraindicate it.

The compound fractures caused by the projectiles of the present war present special features, the most important of which may be enumerated. The comminution of the bone may be extreme, so that several inches of the shaft are reduced to splinters. The high velocity rifle bullet at close range imparts its own terrific momentum to the bone fragments and scatters them; this effect is enhanced by the explosive action of the zone of compressed air preceding the bullet. At longer ranges, when its velocity is less, its flight more steady, and the oscillation of its base has ceased, it may make a clean perforating hole through bone. The writer has thus seen the clavicle cleanly perforated without fracture, by a German rifle bullet. But, again, towards the end of its flight it becomes more destructive, the heavier base tends to overtake the point, and the bullet somersaults on striking, inflicting serious wounds of soft tissues and bones. Shell fragments, according to their size, produce much comminution, and the round lead shrapnel balls produce either a comminution of the shaft without much displacement, or bury themselves in the cancellous tissue of the ends of the larger bones. The soft tissues are frightfully confused by the explosive effect of the high velocity projectile or the ragged shell fragment; the tissues are seriously devitalized over a wide area, and extensive intermuscular planes opened up, conditions most favorable to the multiplication of bacteria. And bacterial infection is almost certain to occur. The soil in the Western theatre of war, highly fertilized for generations by human and animal excreta, is teeming with bacteria, especially the spore-bearing anaerobes. The soldiers, living the life of moles, burrowing in earth and mud, are plastered with this infected soil. Consequently, every projectile piercing the foul clothing and dirty integument carries with it pathogenic organisms into the wound, and especially the shell fragments, rough and irregular in shape, are apt to punch out and push before them a wad of the various layers of clothing. Fleming,<sup>1</sup> working under Wright's direction, made cultures from twelve average samples of soldier's clothing fresh from the trenches, and found in 10 cases contamination with the bacillus of gas gangrene (*B. aerogenes capsulatus*); in five cases, streptococci, in four cases, the tetanus bacillus; and in two, staphylococci. In other words, we may conclude that a large majority of all cases are potentially infected with gas gangrene. Inci-

dentally, it is striking to reflect on the efficacy of the prophylactic injection of tetanus antitoxin, in view of the widespread contamination of clothing with *B. tetani*, apparently revealed by the above figures. In three months' service in Northern France during the past winter, the writer did not encounter or hear of any case of developed tetanus. Undoubtedly, the best hope for the future in the treatment of gas gangrene and infection by pyogenic organisms lies in the development of antitoxins and vaccines of equal reliability with that of tetanus. To the above enumeration of the unfavorable conditions attending these compound fractures, must be added the profound shock and exhaustion due to prolonged exposure to cold, wet, hunger, nervous strain, the frequently co-existing hemorrhage, and the length of time that may elapse before aid reaches the wounded man. Soldiers hit in the open cannot be picked up until darkness comes to give some protection to relief parties, and even in the trenches it may not be possible to convey them back to the field ambulance until nightfall. The totally inadequate first-aid dressing thus may be the only treatment, which may at best prevent further contamination, but cannot hope to affect the infection already introduced.

In the face of this almost inevitable and virulent infection, the first consideration must be its adequate treatment, and perfect mechanical immobilization of the fragments is at first of secondary importance. As Bowdly<sup>2</sup> points out, this aspect of compound fractures varies with the geographical situation of the battlefield. In the South African War, the virgin soil uncontaminated by manure, and the hot dry climate were strong factors in lessening the incidence of infection, factors aided by the fact that the blunt-nosed bullets of lower velocity of that period had much less traumatizing and divulsive effects on the tissues; and shell wounds, and consequently the carrying in of extraneous material, were much less common.

Granted, then, under the conditions at present existing in Europe, a compound fracture caused by a projectile, the rule is that proper drainage and disinfection must be carried out at the earliest possible moment. The only exception to this rule is the case where a high velocity rifle or machine gun bullet at medium range has passed through a limb, breaking the bone but without showing the explosive effects described at other ranges. In such a case there may be minute perforating wound of entrance and exit already sealed up, without contamination. The sharp-nosed bullet, on the other hand, has clothes and skin and soft tissue around it devitalized. Interference with the wound, to replace the lost tissue, is a serious matter. It may be left alone and sealed up, but it is almost successful only if the steps in the preceding writer's observations are followed.

At a point in the foregoing observations, the



ity of cases, an anesthetic must be given, the wound of entrance and exit thoroughly opened up, all contused, devitalized masses of muscle, fascia or fat radically excised, since it is in them that the bacillus of gas gangrene will most surely find a favorable nidus, and every nook and recess of the wound explored. Early interference is essential, for Carrel's<sup>3</sup> studies have shown the comparative scarcity of organisms in the recent wound, and the unbelievable rapidity with which they multiply. From this point forward there is scarcely a step recommended by some whose utility is not denied by others. Shall comminuted fragments of bone be removed? Obviously not, if large and well attached by periosteum or muscle. Some authorities urge the immediate removal of all small fragments, whether attached or not; others practise it only in the case of wholly free fragments; others, among them Robert Jones,<sup>4</sup> say that loose fragments may be taken out, cleaned and replaced, and may be expected to unite. The writer must confess that in wounds so universally and virulently infected, such a miracle seems hard to believe. In his own brief experience, fragments of doubtful viability invariably had to be removed, and before removal interfered with proper drainage, and seemed to prolong infection.

How shall the wound infection be combated? Everyone who treats infected wounds shares the disappointment experienced by the profession at large, when Lister's discovery failed to produce a means of destroying organisms in the tissues as well as in the test-tube. Skepticism as to the efficacy of antiseptic solutions in cleansing wounds has enrolled many surgeons among the followers of Sir Almroth Wright,<sup>5</sup> who has sought to encourage and utilize the resisting agencies of the patient's own body fluids by the use of hypertonic saline solutions for irrigation or gauze packing of wounds. A copious outflow of lymph is provoked, which may be supposed to wash out the organisms which have already entered the tissues beyond the reach of antiseptic solutions, and inhibits their multiplication by the antibodies it contains. Moreover, the 5% saline solution is said to be actively bactericidal. When for the hypertonic solution is substituted a normal saline solution, leucocytes are attracted in greater numbers, and by their phagocytic action tend especially to clean up streptococcus infections. While many wounds under the writer's charge, after proper drainage had been instituted, did well under the hypertonic treatment, the very striking results reported by the originator were not often duplicated. The writer, like others, is compelled to acknowledge the comparative inefficiency of antiseptics in badly infected compound fractures, but he does not share the belief that such solutions act beneficially solely by the mechanical washing away of organisms. When used early before the organisms have penetrated the tis-

sues, they are of great effectiveness; when used later, they still destroy any free organisms, are on hand to attack others as they are thrown off from the tissues, and are useful in preventing infection from patient to patient. Granted that there can be found an antiseptic practically innocuous to the tissues and yet possessed of bactericidal powers, it would seem that its free use in infected compound fractures was the most rational treatment. Such an antiseptic seems to have been rediscovered in hypochlorous acid or its salt, hypochlorite of sodium. It is strongly bactericidal, apparently quite harmless to tissues, cheap, easily produced. In the writer's experience, badly infected compound fractures may be most effectively cleaned up, after incision, removal of all devitalized tissue, and establishment of proper drainage, by the free use of hypochlorite solution as constant irrigation or as wet gauze packing, frequently saturated and kept moist. Its harmlessness is shown by the employment in a number of instances of a solution of hypochlorous acid as an intravenous injection in septicemia, with good results.<sup>6</sup>

The number of splints devised to immobilize compound fractures is legion, and testifies eloquently to the imperfect character of the majority. In the writer's opinion, plaster of Paris, even when used in the most skilful manner, is inappropriate for these cases during the stage of their acute infection. Its dressings are heavy, cumbersome, take much time for their application, often do not provide effectively for extension, and, worst of all, it is almost impossible to keep them from contamination with wound discharges or irrigation fluids. In the secondary treatment of these cases, when bone grafting or other corrective measures must be tried, plaster finds its field of usefulness. The most universally useful type of apparatus is the Thomas knee splint, or one of its numerous modifications, such as the Page splint, in which the ring for counter-pressure is replaced by a curved piece, forming three-fifths of a circle. These splints are simple, cheap, easily made, and durable, and adapted for almost all fractures of either lower or upper extremity. Extension is secured by surgeon's plaster extension straps, applied in the usual way, which are then secured to the transverse bar at the distal end of the splint, forming a fixed extension. The limb is prevented from sagging by slings or gutters of perforated zinc or aluminum, which are adjusted to suit the individual case and interrupted, if possible, opposite the wound; or, if the latter is too extensive, these perforated strips of metal are sterilized by boiling, and applied directly beneath the wound, whose discharges pass through the perforations into the dressing. These splints allow of easy transportation, and when suspended to the horizontal bar of a Balkan splint, or better still, to one of the many ingenious travellers on a modified Balkan splint, they permit of the patient moving quite freely



about in bed without disturbing either the alignment or extension of the limbs. Certain fractures of the femur present special problems, which have been met, in the case of fractures of the upper third, by Jones' abduction frame, and in the case of very extensive multiple wounds, by the ingenious suspension hammock beds of Sinclair<sup>7</sup> and others.

It is interesting to find that the use of bone plates as temporary splints in infected compound fractures in civil practice, as just recommended, has been duplicated and strongly urged by some observers under the conditions existing on the battlefields of France. Lake<sup>8</sup> advises the plating of infected compound comminuted fractures of long bones, thus securing the maintenance of proper length, making external splinting unnecessary, and making the dressing of wounds and treatment of sepsis infinitely easier. During the first three or four days after the receipt of an injury, he makes vigorous efforts to diminish the sepsis, then the plate is applied and left for three to four weeks. He reports no ill results from infection of healthy marrow and finds that the screws do not loosen so prematurely as to impair the results. Pennell<sup>10</sup> is even more radical, advising this procedure as a routine, and claiming that he has rarely had to remove a plate. The writer confesses that the degree and virulence of the infection and the extent of the trauma seemed to preclude this method in the cases under his observation, but in view of the good results reported, he believes that the method deserves a fair trial.

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## DISCUSSION.

DR. ROBERT W. LOVETT, Boston: The part of the subject that I wanted to speak of in this discussion is the question of fracture of the neck of the femur and the difficulty of getting it to unite, because, of course, this is a difficulty that

we all are constantly meeting. The orthopedic surgeon, perhaps, sees the worst cases, because they are apt to come at the end, when everything else has failed, and in these cases he is naturally at a loss to know what to do, so that anything that can be done to diminish the number of these cases of non-union is most desirable.

One difficulty comes in the interpretation of the early x-rays, because in the x-ray we are apt to forget that we are looking upon the contour of two irregular surfaces, and it is very easy for the two shadows to overlap each other in such a way that there appears to be union. Many of these cases, however, when they begin to walk show by the stretching of the apparent union that there never could have been good union there, and I have seen many cases in which in the early stage the opinion was expressed on the strength of the x-ray that good union had occurred, yet where stretching began when walking was undertaken.

The experience in coxa vara which we have at the Children's Hospital bears somewhat on this question. Coxa vara, as you know, is a depression of the neck of the femur to a right angle with the shaft, and the routine treatment that we use in these cases is forcible abduction of the leg under anesthesia, with a view of inducing a fracture of the neck of the femur. In other cases we divide them with an osteotome in case they are resistant to the simpler method. Under these conditions we have an artificial fracture of the neck of the femur—slides shown here.

In a series of these cases it has been very definitely shown that we get a better position of the fragments if we add traction to abduction. With simple abduction the fragments tend to slip by each other, but with abduction and traction, as shown in the slides, we get excellent apposition.

It is not unlikely that this may have a bearing on the treatment of the fracture of the neck of the femur, where, instead of using simple abduction, we should probably get better position if we added traction to the abducted position.

DR. J. B. BLAKE, Boston: I have seen a case in which it is not possible to follow the suggestion of Dr. Lovett, and that is a compound fracture of the neck of the femur. Dr. Scudder and Dr. M. J. Keen have been very successful in treating it by the use of the interpedal hammock bed. I was told that the patient was able to walk in a few days after the operation.

THE PRESIDENT: I am sure that the use of the interpedal hammock bed is a very valuable method of treating compound fractures of the neck of the femur. It is a method that is well worth trying in such cases.



importance, with the laceration, more or less complete, of a very wide tendon, and finally with an injury which invades the largest joint in the body. Therefore, unless we are careful, we may make an illogical deduction and may inaugurate treatment as if the injury was a simple fracture and nothing more. We must remember that it is not simply the apposition of the fragments of a broken patella that is essential to good and complete motion later, but the accurate and complete suture of a great tendon and its lateral expansion. Indeed, it is quite possible that the result, so far as the patient is concerned, may be admirable, and yet there may be a distinct separation of the patellar fragments. It would probably be best to teach the students the treatment of fracture of the patella on the basis that it is not primarily a fracture at all, but that it is a tendon wound which must be repaired. Furthermore, this tendon adjoins a great joint cavity, and once infected the sepsis is horrible, meaning often a loss of the patient's life, or invariably a damaged or annihilated joint. This danger of sepsis is by no means theoretical. It has occurred in the hands of most skilful surgeons and under all possible hospital precautions. It is obvious that only those who are properly trained should undertake such operative measures.

Not all cases of broken patella should be operated, and the reason is that some are only fissured or comminuted fractures without displacement, that is, without laceration of the quadriceps extensor. In these cases fractures of the patella unite well because the fragments are held close together, and since there is no laceration of the tendon, there is nothing to repair. These are what Dr. Joseph Blake spoke of as direct violence fractures, which form a small percentage of the total number. The tear fractures are due to indirect violence. There are, of course, varying degrees of separation in the indirect fractures according as the tear is more or less complete. This, on careful examination, will be found to vary widely. I have seen tear limited almost entirely to one side of the patella. Surgeons will vary in judgment of the amount of separation of the patellar fragments which indicate operation. I should differ with Dr. Scudder on this point, since I should operate in any case in which the separation of the patellar fragments was equal to a finger breadth, assuming that there were no other contra-indications to operation.

All compound or open fractures are to be operated as a matter of course. As a rule, five to eight days should intervene between the accident and operation; this gives an opportunity for the establishment of constitutional immunity. The general contra-indications to operation are extreme age, poor general condition, and threatening delirium tremens; of these, the most important is threatening delirium tremens. In some sixty cases, I have had one death. This

was due to delirium tremens, and not to the fact of the particular operation. The operative result was excellent; a first intention wound and normal temperature for ten days, then acute delirium tremens set in and the patient died of terminal pneumonia. The mistake in this case was not the fact that I operated upon a fractured patella, but that I did any surgical operation whatsoever.

The technic demands absorbable sutures, and only absorbable sutures, except in the rare cases in which wire is absolutely necessary to maintain apposition of patellar fragments; when the torn ligaments have been approximated, the patellar fragments will come together closely, since the clot and the interposed ligament and periosteum have been removed.

I think Dr. Scudder's clamp will be of distinct advantage in a certain number of cases. Screws and plates, however, are never indicated in my judgment. The danger of using wire is very well shown in one of Dr. Miller's x-ray plates, where the wire was broken and apparently entered the joint cavity.

As to refracture: Refracture may be expected to occur wherever secondary violence is equal to and is applied in a manner similar to that which caused the original fracture. I have had one case in which the patella was fractured four times.

DR. JOHN HOMANS, Boston: My discussion will have to be confined to the treatment of fracture of the neck of the femur. I should like to have spoken on Dr. Darrach's paper, the subject of which seems to me very important, but I was too late to hear it.

I had the honor of helping Dr. Cotton do one of his impaction cases, and it is on that case that I am going to base what I have to say on the subject. I do not think Dr. Cotton has done justice to his own skill. It struck me in seeing him place the bones in apposition for impaction that it was a very difficult thing to do, that it required a very keen sense of touch and familiarity with joint fractures, which Dr. Cotton has; and I do not feel that most of us could replace the fracture in such accurate apposition that it will practically stay in place without being held. That seems to me something which we all of us have to acquire with a good deal of difficulty and a good many failures. Moreover, even when the bone is impacted, it seems to me that you are dealing then with a bone graft, that the head of the bone is still a pure bone graft. It has no blood supply, the blood supply having been cut off, and it has been very interesting, therefore, to follow the x-ray plates of the case which Dr. Cotton impacted at the Brigham Hospital. There was at first perfect apposition with no shortening. The head of the bone looked perfectly normal. It is now some five months, and the position has remained good. The patient has been able to use her leg, although



bearing no weight upon it, and the function is perfect, aside from the weight-bearing. On the other hand, the x-ray shows that the head of the bone is going through a period of extreme atrophy, and the last x-ray plates in this respect are different from the first ones. Whether the hip is coming out all right in the end, or whether it is coming out better than it would have under treatment by abduction only, I do not know. That may be the weak point in Dr. Cotton's treatment. If the case is not so traumatized that the repair can still take place, then he has accomplished a great deal.

If, on the other hand, the fragments could be put in apposition by any such scheme as Dr. Lovett has spoken of, I am not sure that this might not be just as good. At the present time it seems to me that Dr. Cotton has shown what no one else has, namely, that if one can place the fragments together properly, they will heal. In many cases impaction certainly does give excellent results.

I am anxious to follow our own cases with the x-ray to see how long it is before that head becomes solid and we get back the normal bone structure.

Finally, of course Dr. Cotton has spoken of the difficulty of using this treatment on the aged and infirm. It seems to me, as we all see cases in large hospitals, that we do not find a very large portion to which this treatment can be given, and the cases to which it cannot be given may very well have to be treated without any adequate fixation, and those are usually failures.

I should very much like to see a parallel series of cases treated by abduction, possibly with traction, in as skillful hands as Dr. Cotton's, having the bones placed in position but not impacted, and see that series treated alongside of Dr. Cotton's impaction cases.

DR. F. B. LUND, Boston: I think we owe a debt of gratitude to Dr. Darrach for calling attention to the fact that under temporary dressings so much swelling takes place within two or three days, that by the time permanent dressings are applied reduction is much more difficult. I have found that when I was on hand to reduce a fracture and put it up in plaster of Paris as soon as it came to the hospital, the reduction was much more easy than when it had been dressed for a few days in the time-honored pillow and side splints, and infiltration had taken place about the ends of the bone.

Another admirable point made by Dr. Darrach was that the length of time in which the pressure from deformity takes place is just as important as the amount of deformity. His paper is exceedingly sensible and timely, and should teach us that fractures are emergencies and should be treated as such.

In regard to Dr. Scudder's paper, where unabsorbable sutures are used, if there is much

tension, the apposition is not apt to remain perfect, and I think this device for holding the fragments together while the sutures are applied, and doing away with the eversion of the fragmented surface of the lower fragment will enable us to place our sutures more accurately and get better results.

Dr. Cotton seems to have come nearer getting satisfactory results in these fractures of the hip than any treatment that I have seen. In ununited cases, I have tried nailing them, with unsatisfactory results. In one case I took out the head of the femur and nailed it on to the ilium, just above the acetabulum, to act as a buttress and prevent the great trochanter from slipping by. It was not effective, and I mention it only to condemn it.

DR. W. J. MIXTER, Boston: In regard to fractures of the base of the skull, it may be interesting to say that our experience at the Massachusetts General Hospital in the past few years has approximated very closely what Dr. Harvey Cushing suggests. Between the years of 1890 and 1911, when Dr. Homans started to do the fractures, the mortality was 57%. Since that time it has been cut down to 41% and it is lower in my own cases. In the earlier series there were 260 cases, and since that time there have been 125 or 130.

I think that what Dr. Darrach said is also being said of fractures of the base of the skull. As soon as it is possible to decide whether a decompression with drainage is advisable, it should be done.

DR. J. COLLINS WARREN, Boston: I have listened with great interest to what has been said this afternoon. As I have followed the reading of the different papers it has been borne in upon me that this important department of surgery has not only come into its own again, but is being accorded the consideration which it deserves in the alignment of the new surgery. I was especially interested in Dr. Darrach's statement of the pathology of the processes which surround the repair of the fractured bone and the importance of a method of greater precision in outlining its treatment.

In old-time surgery there was a polite fiction that when the fracture was "set" and had been done that was necessary for the adhesion of the fragments. As long as they were held by in contact, even though overlapping one on another, the callus formation and the blood absorption provided for an adequate reformation of the function of the broken bone.

When, with the advent of a splint, the interior of the body became a well-defined place of interest to the surgeon, the department of surgery which we are now entering upon, of the time being to be placed in the hands of the hospital surgeon, the surgeon's attention was directed to the care of the fracture, and the surgeon's house officer, the surgeon's assistant, the



which the x-ray has brought with it has changed all this. Our knowledge of the pathology of fracture has been enormously increased, and the haphazard manipulations of the old-time surgeon have given place to methods of precision, and it is quite evident that the treatment of this surgical lesion is now being placed on a new and thoroughly up-to-date basis.

The old-time treatment of fractures, which was an opprobrium of surgery, and the source of much anxiety and misery of mind to many a practitioner will, let us hope, become a thing of the past. The standardization of this surgical lesion, which modern methods will enable us to bring about, will carry satisfaction with it to both surgeon and patient, and peradventure snatch from our brothers of the legal profession a claim upon this field of surgery, which will now become exclusively our own.

DR. WILLIAM DARRACH, New York: I quite agree with Dr. Homan on the question of hips. We must differentiate between the subcapital and the trochanteric varieties, as they are distinct. There are better results in the outer breaks and poorer results in the inner breaks.

I think Dr. Cotton's successful results are due to his good reduction rather than to his impaction.

### Original Articles.

#### THE FLEXED SPICA AND WHEEL CHAIR IN THE TREATMENT OF FRACTURE OF THE NECK OF THE FEMUR.

By G. A. MOORE, M.D., BROCKTON, MASS.

OTHER conditions being equal, poor results in the treatment of fractures are attributed either to the methods employed or to lack of skill in reduction and care during convalescence. Mobility of fragments of bone following fracture is the rule and is not considered unfavorable to repair; impactions are uncommon and are a detriment to normal repair of normal function.

The literature upon hip fractures, especially text-books, does not follow this rule regarding poor results. In this class of cases, deformities and disabilities following treatment are not attributed to the method or skill exhibited, but to the peculiarities of the anatomical structures involved in the injury, the inaccessibility of the fragments to the applications of splints, etc., the deforming influence of the muscles about the hip joint, and the lack of regeneration of bone in this region.

Mobility of fragments following injury, or the loose type of hip fracture, are the cases in which a poor prognosis is given regarding bony union, deformity and normal function following treat-

ment. In the impacted type, a more favorable prognosis is given, since a larger percentage result in bony union, though deformity and loss of function may be marked. In hip fractures the patient is considered fortunate who has an impaction of the fragments, and the rule has been generally accepted, especially in the aged, that however great the deformity, impactions should not be broken up.

The first reason for the poor results obtained in hip fractures is probably one of the chief causes in older methods of treatment, which embodied some form of traction and splints. In the complete unimpacted types, reduction of deformity and apposition of fragments is frequently accomplished, but as yet no type of splint has been devised, nor a method of application evolved by which both fragments of the neck of the femur are immobilized during treatment. One exception to this statement should be made, the Thomas hip splint or some modification of it.

In all of the methods which depend upon splints and traction for reduction and immobilization, a certain amount of movement of the hip occurs in the care of the patient's back, the use of the bed pan, changing sheets, etc. If the fragments are impacted, and the impaction does not become disengaged, these movements do not interfere with the process of union; but if the fragments are loose, movements undoubtedly retard the normal regeneration of bone.

One of the old rules, which has become an axiom in the treatment of fractures, is to immobilize the joint above and below the site of fracture. The methods advocated by Lucas-Championnière have been adopted by few surgeons, since it is generally believed that repair of bone takes place more rapidly when the broken fragments are not only accurately approximated, but are immobilized.

It would seem that the advocates of traction and splints, in the treatment of hip fractures, have accepted the teachings of Lucas-Championnière, in part at least.

Further in regard to the muscles causing deformity of fractures, it has been found that better approximation of the fragments is obtained and immobilization assured, when, if possible, the limb is placed in a position which relaxes these muscles. Traction methods disregard this principle, and depend upon reducing deformity by tiring out muscles which produce it.

In the method of abduction, as advocated by Whitman, certain principles governing the treatment of fractures in other parts of the body are maintained: (1) Deformity, if present, is reduced before the application of the plaster cast. (2) The broken ends of the fragments are placed in apposition by placing the limb in abduction and inversion. (3) The short muscles about the hip joint, which are most active in producing deformity, are relaxed. (4) The adductor group of muscles and the ligaments of



the joint, which maintain apposition of the fragments in the abducted position, are put on stretch. (5) The danger of the most common deformities which limit function—coxa vara, eversion and adductor contraction—is minimized. (6) Immobilization of the fragments is assured by the application of a cast which fixes the leg and pelvis in the position of reduction. Patients treated by the abduction method, of necessity are bed patients during treatment, but the dangers of recumbency in old patients are lessened by raising the head of the bed and turning the patient on the side.

Statistics from some of the larger hospitals are of interest as illustrating the high mortality following this injury, and the low percentage of good functional results with the older methods of treatment. Seudder, in 1907, reported the end-results of sixteen cases treated at the Massachusetts General Hospital. But two had functionally useful limbs; thirteen used crutches or cane or had disability in going up stairs. Only three of the patients, in his series of cases, were over sixty years of age at the time of injury. Walker reported one hundred and twelve cases, in 1907, treated at Bellevue Hospital, with a death rate of 16%. Eighty of these patients were traced, and but ten were found to be able to do their usual work, while ten were still in the hospital. In the same paper he reported sixteen cases treated by Whitman's method; seven of these patients were over fifty years of age. There were no deaths. Four had recovered completely and had resumed their usual work, the rest were still under treatment. In 1908, Ashhurst and Newell reported fifty-eight cases treated at the Episcopal Hospital, Philadelphia, with a mortality of 27.6%. Twenty, or 34%, they reported as cured. All of



FIG. 2.—Side view illustrating the amount of flexion necessary, enabling the patient to sit in a chair with a cast.

their deaths occurred in old patients, the ages ranging from fifty-nine to eighty-four.

It is generally conceded that fractures through the base of the neck of trochanters always result in bony union under any treatment, that disability in this class of cases is due to deformity and not to lack of union of the fragments. About 10% of all hip fractures are unimpacted at the time of injury (Colton). A certain number of these are extra capsular, and will result in bony union under any circumstances, reducing the number of loose intra capsular fractures below 10%. From 15 to 27% of all cases treated by the older methods die, which will further reduce the percentage. Probably there are about 6 or 7% of all treated hip fractures which are of the unimpacted intra capsular variety at the time of injury. The number of cases of disability following hip fracture, resulting from deformity alone, is few compared with those whose disability is due to lack of union. Since it is the unimpacted intra capsular variety of fractures that results in imperfect union, it is to be inferred that a large percentage of the poor results, following the older methods of treatment, is due to impacted fractures becoming loose while undergoing treatment. While absorption of the ends of the fragments, lack of penetration of bone and poor blood-supply are factors, the main one at the hip, permitted by traction and special methods of treatment, is probably the greatest factor in the cause of this catastrophe.

In most of the methods of treatment of hip fractures, which have been advocated in the past, recumbency of the patient is a requisite for their application. In attempting to maintain reduction of the fracture, it has been considered as a matter of course that the patient is really



FIG. 1.—Front view of cast, taken about eight weeks after injury. There is some eversion of the foot, after correction of eversion.



as possible the same horizontal plane as the body. To maintain this relationship between the position of the injured leg and body, the Bradford frame and Liston side splint are used in traction methods, and in Whitman's abduction method the cast is applied well up on the chest.

The most frequent causes of death following this injury in the aged are shock, hypostatic pneumonia, exhaustion and decubitus. Of these,

become wheel-chair invalids with a loose fracture for the remainder of their days.

About four years ago, August, 1912, while treating one of this type of cases, a man of seventy-eight, for whom recumbency seemed inadvisable, the idea suggested itself that a plaster cast might be applied upon the same general principles embodied in the Whitman method, modified to permit the patient to sit in a wheel chair. The fracture was the loose extracapsular



FIG. 3.—X-ray of left hip, before treatment. Same patient as in Figs. 1 and 2. One inch shortening, moderate eversion.

hypostatic pneumonia probably claims more unfortunates than any of the other complications. To guard against this, in the Whitman method, the head of the bed is kept raised and the patient is frequently rolled upon the side. In traction methods, such preventive measures are impossible owing to the extension on the leg and the splints. At the onset of serious complications, treatment of the fracture is immediately discontinued, apparatus removed if necessary, and the patient placed in a sitting posture. In many old, feeble patients, this is the only method that will save life. As a result, they

type, base of the neck or through the trochanter. No x-ray was obtainable. There were  $1\frac{1}{2}$  inches shortening. As there seemed to be no contraindication to applying the cast under anesthesia an anesthetic was administered, the patient placed upon a spica board, the leg drawn down to reduce shortening. Then the thigh was flexed to nearly right angles with the body, abducted as far as possible and inverted. The knee was flexed at right angles with the thigh, and in this position the leg was lifted upward strongly. An assistant then held the leg in this position while a cast was applied from just



above the costal margin to about half-way down on the calf of the leg. The cast was strongly reinforced in the groin, and in the back the reinforcing was carried far inward over the ischium. On the uninjured hip it was brought well down over the trochanter. The patient was then put on a high head rest in bed. The following morning he was assisted into a wheel chair, and each day thereafter during the five weeks he remained in the hospital. He was then

sixteen patients have been treated by the flexion method. In reporting this series of cases, one other should be included, whose condition did not warrant any treatment. This patient had pneumonia when first seen, and died about three days later. There was one other death in the series. A cast was applied at home. As a result of incontinence, it became necessary to apply a second cast. The patient was attended by her family physician, and I did not see her



FIG. 4.—Same patient, leg in abduction, with cast on foot.

sent home to be attended by his family physician. This patient had a rather troublesome incontinence of urine, which necessitated applying a new cast at the end of three weeks. There was also considerable swelling of the foot and leg below the cast, which was relieved by a firm bandage. Otherwise his convalescence was uneventful, the cast was removed at the end of ten weeks, and at the end of four months he had normal use of the leg.

The results, in this case, were so gratifying that it was decided to apply this method of treatment in other cases. Up to the present,

for several weeks. I learned that, through the nurse's neglect, decubitus developed, resulting in septicemia and death. Now of the sixteen patients were over seventy, and of the twenty of the hospital, is eighty-seven. There were between sixty and seventy three between fifty and sixty, and between forty and fifty. Seven patients had been treated previously and were able to bear the treatment. In two the result has been good, but in these was the loss of the foot. In the remaining cases, the result has been good, with the exception of one case, in which the foot was lost. In the remaining cases, the result has been good, with the exception of one case, in which the foot was lost.



and no other visible deformity. The disability is apparently due to weakness of muscles. Three patients are still under treatment. Two have not been traced and one died of grippe twelve weeks after injury, after his cast had been removed and he was walking on crutches.

It has been found that patients are much more comfortable when the cast is applied the entire length of the leg, covering the foot, and

WHITMAN METHOD.  
Leg extended, abducted 45 degrees, inverted.  
Ilio psoas: Lax except few fibres to lesser trochanter.

Pectineus: Tense.  
Gracilis and adductors: Tense.

FLEXION METHOD.  
Leg flexed, abducted 45 degrees, inverted.  
Ilio psoas: Relaxed.

Pectineus: Tense.  
Adductor longus: Relaxed.

Adductor magnus and gracilis: Tense.



FIG. 5. Cast removed.

the method of applying the cast down to the calf of the leg has been abandoned.

In two of these patients, a double spica was applied, but both were so uncomfortable that it became necessary to remove the cast from the uninjured leg. If the cast is applied so that it embraces the great trochanter of the uninjured leg, the single spica immobilizes the pelvis as completely as the double spica.

In the dissected subject a comparison of the Whitman method and the flexion method is of interest with regard to the muscles which aid in maintaining reduction:

Ligaments of capsule: Tense.

POSTERIOR DISSECTION.

Gluteus maximus: Relaxed.

Gluteus medius: Relaxed.

All short muscles about hip joint: Relaxed.

Ligaments of capsule: Tense, except ilio femoral.

POSTERIOR DISSECTION.

Gluteus maximus: Tense.

Gluteus medius: Very tense.

Other short muscles about hip joint: Relaxed.

#### SUMMARY.

There is a relaxation of the adductor longus and the ilio femoral ligament of the capsule in



the flexed position that does not occur in extension with abduction. In flexion the gluteus maximus and medius are very tense, acting as a support to the trochanter, preventing backward displacement of trochanter and eversion.

Regarding the position of the trochanter in extreme abduction: about fifteen dissected subjects were examined at the Harvard Medical School, through the kindness of Dr. John Warren, and while in some the trochanter could be placed within about one-half inch of the side of the ilium, in none could it be made to impinge on the ilium.

#### CONCLUSIONS.

The flexed spica is a modification of Whitman's method of treatment of hip fractures. Reduction of deformity and apposition of the fragments is maintained by essentially the same means. The chief difference is that, instead of the abducted and extended position of the leg, it is immobilized in the abducted and flexed position, permitting the patient to assume the sitting posture. Results have shown that maintenance of the leg and body in the same horizontal plane are not essential to union or good functional results. This method was devised for old, feeble patients, who are able to tolerate some appliance for immobilization, but in whom methods necessitating recumbency seem inadvisable. The results following its use have been much better than were hoped for.

Seventeen patients have been treated; fifteen were over fifty and nine of these were over seventy years. So that, in this series of cases, the method has been applied in the class of cases for which it was devised. There were but two deaths,—one a hopeless case when first seen, the other, through neglect of the nurse, developed decubitus, resulting fatally.

The last patient treated was a woman of eighty-seven, who is about in a wheel chair every day without discomfort.

There was one case of congestion of the lungs the day following the application of the cast, which cleared up rapidly when the patient was put in a wheel chair.

With the exception of one old lady, upon whom a double cast was applied, all have been in chairs daily throughout convalescence. Many of the patients became so accustomed to the cast that they could be transferred from the bed to the chair by merely supporting the leg in the cast.

Strength and general nutrition are maintained by the exercise of pushing themselves about in a wheel chair, so that when the cast is removed these patients have been ready to begin the use of crutches at once.

Immobilization with the single spica has apparently been complete in these cases, and the results have been so satisfactory and the patients so comfortable that the double spica has not been given a fair trial. The double spica or

some other modification may supplant the single spica method as used in the present series of cases, but some form of immobilization in flexion, both of the thigh and lower leg, permitting the patient to remain in the sitting posture, preferably in a wheel chair, has a definite field in the treatment of hip fractures.

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#### Address.

### THE PORTRAITS OF FLORENCE NIGHTINGALE.

By MAUDE E. SEYMOUR ABBOTT, B.A., M.D.

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(Continued from page 421.)

#### V. FLORENCE NIGHTINGALE IN LATER LIFE. (1861-1910. PLATES XII, XIII, XIV, XV.)

Sydney Herbert died in 1861 when Florence Nightingale was forty-one years of age. She lived nearly fifty years longer, and for thirty-five of these retained the full use of all her faculties and the same phenomenal capacity for accomplishing heavy tasks in numerous fields simultaneously, each of which was, in itself, sufficient for the full powers of a single individual. His death threw her into a state of extreme despondency, for she had lost not only a dear personal friend, but the ally on whom her sanitary reforms depended. From the seclusion of a deep retirement she published a short "Life of Lord Herbert," in which she ascribes every part of their reforms to his work. Had he been writing the book he would have made the same statement in relation to herself, and in a sense both statements would have been true, so completely interdependent was their action. In ascribing the credit for all the achievements of the Crimean climax and those resulting from it, the names of Sydney Herbert and Florence Nightingale must always hold an equal place. The British public recognized this fact in the erection, in the winter of 1911, of the dual statues to these which stand on either side of the Crimean monument in London today.

Space cannot permit of even the complete enumeration of all the numerous reforms engaged in this later period of her life. Probably





PLATE XII. MISS NIGHTINGALE IN 1857.

From a picture by Sir William Richmond at Claydon, and reproduced in Sir Edward Cook's *Life of Florence Nightingale*.

the most comprehensive, and certainly that in which an immense portion of her time and energy was expended to the very end of her active life, was the improved sanitation of India,—a problem arising out of the work of the Crimean commissions, and in which she was intimately associated with Sir John Lawrence, Sir Bartle Frere, Lord Roberts, and other leading East Indians. She stood for advanced methods, brought to the evidence irrefutable masses of statistical facts, and fought desperately, among other things, for universal irrigation. She was known at the time in high quarters as the *Providence of India*. "The Indian Sanitary Commission's Report," a huge volume consisting of 2028 pages of small print, contains evidence of her work on almost every page.

In the work of the War Office again, she maintained, after Lord Herbert's death, a very intimate relationship, which in time came to assume the relation of an advisory council. This was because in many questions she had come to be considered the first expert of her time, and also because, in Sir Edward Cook's phrase, she was rightly regarded as the official legatee of Lord Sydney Herbert, and one who knew, as no one else could, the spirit of the uncompleted reforms he had projected, and the traditions which had inspired one who had held a very high place in the public trust. She was concerned in this way, not only in questions of army sani-

tation in time of peace, but in all the problems that arose in the care of the sick and wounded in the various wars that broke out during this long period, and her connection with the organization of the Red Cross Society, and the various associations formed for the care of the sick and wounded, runs like a silver thread through the story of this latter part of her life. Thus we find her, during the course of the American Civil War, writing on October 8, 1861, to Dr. Farr, that she had sent to the Secretary of War at Washington, on application, all the War Office's forms and reports, statistical and otherwise. At this time also a Sanitary Commission was appointed at Washington, which reproduced much of Miss Nightingale's Crimean work. Again, on December 18, 1861, we find her revising the draft of the commissariat and army medical stores for the projected expedition from England to Canada in connection with the Trent affair.

The inception of the Red Cross Society on an international basis owes its origin to the suggestion of a Swiss physician, Henri Dunant. In the year 1859, when the full flood of Miss Nightingale's Crimean achievements were still fresh in the public mind, the bloody battle of Solferino was fought, and the wounded lay three days upon the battlefield untended, except for the irregular ministrations of neighboring peasants. Shocked at the sight of the tragedy, and proclaiming the possibility of organized aid that the Crimean campaign had shown, M. Dunant carried the proposal to the leading European powers. "that an organization with international privileges be established for the care of the sick and wounded in war." As a result, in August, 1864, an International Congress was held at Geneva, which framed the famous Geneva Convention, on which the constitution of the present Red Cross Society is based, and which declares medical aid on the field to be under the protection of a recognized neutrality. The British delegates to the Congress were Miss Nightingale's friends, Dr. Longmore and Dr. Rutherford, and she drafted their instructions. In 1872, M. Dunant in a paper read in London, said: "Though I am known as the founder of the Red Cross and the originator of the Convention of Geneva, it is to an Englishwoman that all the honor of that Convention is due. What inspired me to go to Italy during the war of 1859 was the work of Miss Florence Nightingale in the Crimea."

In the War of 1866 between Prussia, Austria and Italy, all three of the combatants sought and obtained the assistance of Miss Nightingale and she herself joined and took part in the London Relief Association for the care of the wounded. In 1867 a gold medal was awarded to her by the Conference of Red Cross Societies in Paris, and in 1870, the Austrian Patriotic Society for the Relief of Wounded Soldiers elected



her a member. During the whole duration of the War of 1870-71, she was again plunged into ceaseless activity, for both Germany and France deluged her with correspondence. She met all demands, and rendered assistance impartially to the sick and wounded of both sides, so that in July, 1871, the French *Société des Secours aux Blessés* conferred its bronze cross upon her, and in September of that year she was decorated by the German Emperor with the Prus-

mortal a city of ancient Rome. And in writing to the Crown Princess of Prussia on hospital matters, she pleaded for clemency. "Prussia would remember," she was sure, "the future wars and misery always brought about by trampling too violently on a fallen foe." We know, alas, only too well, how sadly her assurance was disappointed. During Lord Wolseley's Egyptian campaign of 1882 she was active in organizing the female nurses who were re-



FIG. 131. MISS NIGHTINGALE. (L. E. L. 1871.)  
Portrait taken by Messrs. S. G. Payne and Sons of Avebury, Long, Wiltshire, England.  
(Possession of Miss H. A. D. 1871, M.)

sian Cross of Merit. In spite of the strict neutrality she maintained in giving aid to the wounded of both sides, it is interesting to us, in this year of war, 1915, to know that her personal sympathies were rather with the French. "I think," she wrote on December 20, 1870, "that if the conduct of the French for the last three months had been shown by any other nation it would have been called, *as it is*, sublime. The uncomplaining endurance, the sad and severe self-restraint of Paris under a siege now of three months would have rendered in-

quested, and magnificent." And in writing to the Crown Princess of Prussia on hospital matters, she pleaded for clemency. "Prussia would remember," she was sure, "the future wars and misery always brought about by trampling too violently on a fallen foe." We know, alas, only too well, how sadly her assurance was disappointed. During Lord Wolseley's Egyptian campaign of 1882 she was active in organizing the female nurses who were re-



ing with the spirit of it than that expressed at the Eighth International Conference of Red Cross Societies in London in June, 1907, to which Queen Alexandra sent a message referring to "the pioneer of the First Red Cross movement, Miss Florence Nightingale, whose heroic efforts on behalf of suffering humanity will be recognized and admired by all ages as long as the world shall last." The resolution read: "The great and incomparable name of Miss Florence Nightingale, whose merits in the field of humanity are never

the worst possible. From a noted philanthropist came the suggestion, that at the Liverpool Work-House Infirmary, one of the most difficult institutions of all, the experiment should be tried of placing twelve Nightingale nurses in control, with a superintendent chosen from among them. The story of Miss Alice Jones, a gentle girl of high religious views, a graduate of Kaiserwerth, and later of the St. Thomas's School, who struggled and won victory among vicious patients and a difficult management, and who gave up her life in doing so,



PLATE XIV. FLORENCE NIGHTINGALE IN HER ROOM IN SOUTH STREET AT THE AGE OF EIGHTY-NA.

From a photograph by Miss Bosanquet, 1906, and reproduced in Sir Edward Cook's *Life of Florence Nightingale*.

to be forgotten, and who raised the care of the sick to the position of a charitable art, imposes on the Eighth International Conference of Red Cross Societies the noble duty of rendering homage to her merits by expressing warmly its high veneration."

Another large sphere of activity which arose since the time and outside of the department of Sydney Herbert, was that of Work-House Reform, a movement which grew directly out of the work of the Nightingale Training School. In the year 1864, no legislation provided for the care of the sick poor in England, and an absolute lack of attendance combined with a degraded class of patients to make the conditions

is one of the romances of the history of nursing. It is told by Miss Nightingale under the title "Una and the Lion" in good words. The success won here led the way for the Metropolitan Poor Act of 1867, which was a starting-point of medical relief to the poor in England, and is to be traced to the efforts of many earnest men and women, and chief among them to Miss Nightingale.

The failure of one of her attempts, that is, of the Training School at the Lying-in Department of the King's College Hospital, is to be recorded. It is of importance chiefly today, because it led to the publication of her "Notes on Lying-in Institutions," which is to be compared to the "Notes on Nursing" in its clear-



ness and originality and the soundness of its practical applications.

The Nightingale Training School was always under Miss Nightingale's supervision, but after the year 1872, when she retired, more or less, from more active association with other forms of work, and when it was removed to the present new St. Thomas's building, she identified herself still more closely with it, and it sheds other light upon her extraordinarily many-sided character. Here again, as in her youth, we see her from the domestic side. She is in close contact with her nurses, knowing each one personally, criticising and loving, chiding and helping, always on the highest plane of prin-

stood to her in the relation of "affectionate children" or "dear sisters," who had gone out into the world to carry her gospel of what the art of nursing meant to many distant lands.

In the fullness of time, after a life so crowded with productive labor, philosophic thought, and literary activity, so rich in sympathies and affection, and so transfigured by a deep religious faith that one could scarcely imagine its equal, death came to her, three years after the Freedom of the City of London and the King's Order of Merit had been conferred upon her. To the end she counted herself an unprofitable servant, and realized only the high values of those things which she had struggled to attain.



PLATE XV. FLORENCE NIGHTINGALE IN 1907.

From a watercolor drawing by Miss F. Alicia De Billeh. Footnote, and reproduced in Sir Edward Cook's *Life of Florence Nightingale*.

ciple, and with a depth of personal feeling and sympathy that brought her into the closest range of influence with those whom she was trying to inspire. Every year she formulated her teaching in a hospital sermon, which took the form of a letter, publicly read to the nurses. In these days her home at South Street was always open to her pupils, whom she met here in a sense on equal terms, and all loved her dearly. Just as in her beautiful girlhood she had sat at the feet of Elizabeth Fry, and had drunk to her soul's fulfillment of the springs of that ripened humanitarianism, so in her own latter days, these daughters of her heart's best wisdom gathered about her to learn from her own lips what it was she would have them to do. As the years closed in about her, her nurses

## Industrial Accident Insurance

### RESTORING THE INJURED EMPLOYEE TO WORK.

By FRANCIS D. DONOHUE, M.D., BOSTON.

*Medical Adviser of the Industrial Accident Board.*

THE goal of the long march of civilization is industrial peace, of that social condition where, as far as human provision can do it, the specter of old age, with its industrial idleness, its economic dependence, and its quasi-charitable treatment, is eliminated, and since the peace of one nation is based on the same elements as that of another; universal peace can come only with universal content, which is dependent on the industrial peace and content of a world of workers. Industrial peace means hope, happiness, health and homes, confidence in the age of efficiency, contentment in the years of waning powers; and the community presenting such conditions is the abode of opportunity and optimism—the ideal community.

According to the latest compilations showing the operations of workmen's compensation laws in the United States, there are thirty five divisions of state and territory subject to the control of the United States in which there are compensation laws in force. This includes Hawaii, the Canal Zone, and the federal government. When we stop to consider that this enormous movement in one branch of social legislation has been the growth of only five years of this century, the fact is apparent that there is a powerful, vital, impelling force behind such legislative initiative and enactment. If we do not stop to consider being the more practical and timely enactment of such legislation, which vary in their scope, facilities and under different conditions, the present situation probably may be said to be a favorable one, stating that this social legislation is due to a growing consciousness of the value of the

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this country that the value of the human being engaged in productive labor, or in other forms of necessary work or service, is one of the country's strongest assets. In other words, such legislation represents in part the practical application of the principles underlying the conservation-of-human-energy idea.

Employers of labor have been insured under one form or another for a long while, and by reason of this insurance, which insured the employer against trouble, a certain system of handling accident cases has grown up, based upon the desire to shunt off a claimant as easily and as cheaply as possible.

It comprehended nothing of the rights of the employee in regard to restoring his working capacity or mitigating his disability. The new compensation laws are the opposite of this because they have as an essential, the insurance of the wage-earning capacity of the employee, and anything that reduces, temporarily or permanently, the wage-earning capacity of the employee, is a proper charge against the compensation insurance.

If we accept this interpretation of the real meaning of the movement, the suggestion is then in order that in the work of administering these laws daily, sight should not be lost of the real end in view. Obviously, the philosophical genesis of the idea may be only in part written into the actual statute. For this reason, there is a sacred obligation imposed on those administering such laws, to enforce not only the provisions of the act as written, but in such manner as to make effective the causative forces behind the written provisions. This principle entails one other duty, namely, constructive administration to procure improved law, or methods, by which the basic principles of the law may be carried out with the highest efficiency.

Following this introductory statement, the question naturally arises, What are the basic principles of a compensation law? The idea may be variously phrased, but the following is presented as one way of expressing the objects to be accomplished.

*First*, Rehabilitation of injured persons, and the economic readaptation of dependents in fatal cases.

*Second*, Financial relief during the period of readjustment.

*Third*, Accident prevention.

In connection with the consideration of the problem of rehabilitation, the following are essential in laying a foundation for the proper care of every case and the earliest possible restoration of the injured employee to industrial efficiency:

(a) Prompt and efficient first aid is most important.

(b) Time is an essential requisite.

(c) Efficient hospital service.

Illustrating the importance of prompt and efficient first aid, the records at the plant of the Norton Grinding Company, at Worcester, where

first-aid work has been in charge of Dr. W. Irving Clark, there has not been a single case of infection following injury during the last five years. Every type of injury was encountered, including the most dirty, and it is perfectly evident that only prompt and skillful treatment can account for this surprising and gratifying result.

Time is a more important element than the busy physician is willing to admit. This is well shown in fractures which, if treated at once, can be more easily set, and with better after-results, than if they are allowed to wait and care is given after delay, accompanied by swelling and disturbances of circulation—conditions adding to the immediate difficulties and laying the foundation for future trouble.

After first aid, rendered promptly and efficiently, comes the consideration of adequate hospital care. Hospital care should mean efficient hospital service. We have all kinds and methods of treatment in Massachusetts under the Act. Some treatment is furnished by the insurance companies, either by men with whom they make direct arrangements or by the utilization of private or public hospitals. Free choice of physician is allowed the men in a large percentage of the cases. The first kind of treatment theoretically is the best kind of treatment, because it is presumably carried out by those more expert in the surgical care of the patient than the ordinary practitioner. A large proportion of the cases are necessarily hospital bed cases. Under the old law, which was in effect up to October, 1914, at the end of the fourteenth day the responsibility of the insured ceased and the responsibility of the man himself came in. The Legislature of 1914 permitted the Board, in unusual cases, to order the insurer to give treatment beyond the fourteenth-day period. By the payment of a little additional money now, the injured man is given continued treatment after the fourteenth day, and he is restored to industry more quickly and in better condition than if thrown upon his own resources at the end of the two weeks' period. Giving a man hospital care for the first fourteen days, and then discharging him to the resources of a home from which the pay envelope has been absent for two weeks, and compensation payment is not due for seven days more, can hardly be called ideal.

From our standpoint, the efficiency of hospital management is not represented by the purchasing price of provisions, the purchasing price, perhaps, of milk, or the utilization of medical and surgical supplies to the best advantage and at the lowest cost. Hospital efficiency, from our standpoint, should be represented firstly by the time it takes to restore a man to work, and secondly the end-product that the hospital furnishes in the line of a good workable result.

Dr. E. A. Codman of Boston has pointed out in a study of efficiency which he has made, "that



no good factory neglects careful supervision of its end products, and it is perfectly evident that the state or city, and the citizens who by private gifts or by way of the tax office make possible and support these huge plants, have a right to know what they are producing and what the actual end result in actual benefit is."

Every compensation board should strive for a measuring of end products, represented by the time taken to complete a cure and the amount of disability represented by the difference in wage-earning capacity of the employee when he is back on his job. It may be possible that hospitals may be grouped according to their end products, and weekly payments allowed on the basis of hospital efficiency. Is it not our duty to the workman whose future depends upon the treatment given, and to the community which depends upon the worker, to strive for better results?

Many authorities have claimed that compensation and other forms of social insurance have led to a destruction of the ethical standards. It has been claimed as a result, "malingering has increased, traumatic neuroses, so called, have been fostered," and that "the number of claims for illness has increased out of proportion to the number of insured." If that has been true of England and Germany, it has not been the experience in Massachusetts under the Workmen's Compensation Act.

In three hundred consecutive examinations of disputed cases under our Act, I did not find a single deliberate fakir. These cases were, however, mostly adult workers with wage-earning capabilities far beyond the compensation. There is a tendency, however, in three well-marked groups not to minimize the results of accident or injury. They are, however, a small per cent. of our totals.

The first group is composed of the men in what may be called the twilight zone of life,—the ages above sixty. Here the man is arriving at the end of his strenuous working days. His vital forces are running down, changes are occurring in his circulatory system, and the organs and tissues depending upon it for their upkeep. He professes to be as good a man as he ever was, but he is not keeping the stride with the younger workers. Perhaps he has been obliged to take a lighter or a different job than he formerly was able to do. This man when knocked out of his working stride by injury is hard to patch up.

The second group is made up of the regular drinkers. Dr. William J. Brickley, of the Boston City Hospital Relief Station, has made an interesting contribution to the literature of the subject. This represents a study of about 40,000 cases a year over the second year. It may be stated, based upon his experience, which Mr. Holman has given you in some detail and which I wish to emphasize, that:

- a. Alcohol causes accidents.
- b. Alcohol obscures the diagnosis.

c. Alcohol increases the danger of infection at the time of the accident.

d. Alcohol prevents adequate treatment.

e. Alcohol increases the danger of inter-current complications.

f. Alcohol retards the process of repair.

g. Alcohol gives a poorer end result.

h. Alcohol increases the mortality in accidents.

It is enough to refer only to the figures in accident cases which resulted fatally. "During the years 1911 to 1914, inclusive, there were 658 fatal cases at the hospital, and of the adults who died because of the accident, 40.6% were under the influence of alcohol when they were received for treatment." The condition of alcoholism contributed materially to the fatal termination of these cases. The presence of saloons in the manufacturing districts is a well-known and apparent danger. The eleven o'clock, or later closing hour, in the home district of the worker, is even a greater danger.

It would seem that saloons, if permitted in residential districts, might have a closing hour not later than 9 o'clock and the opening not earlier than 8 in the morning. Labor exchanges are necessary adjuncts to compensation rehabilitation. In properly organized exchanges, intelligent labor union cooperation will be found most desirable. In Massachusetts the labor leaders, including the much-abused "walking delegate," have not only rendered the greatest possible assistance in the problems of reemployment, but in many instances have been of the utmost importance in aiding in the determination of the rights of injured employees or their dependents.

Do not underestimate the value of the aid that unions can give. They have members trained in fraternal societies, as well as in the union's administration of sickness and accident benefits for years before either was considered necessary by the community at large. There would be increasing aid from "union" sources if their members were fully informed that in protecting and helping others their own rights would be safeguarded.

The idea that cases have a "lump sum value" is a distinctly bad one. It is open to the objection that an employee does not make his best effort at work resumption or readjustment, either through his own volition or because encouraged by legal advice, for settlement of a lump sum a lawyer could often get for him. It may be open to abuse on the part of the compensation payor, or the claimant, or the attorney, or the "ragged" or "tender" or the "charity" or as a labor Nerve Center, or the "lump sum" lawyer, or the "lump sum" doctor. It should be carefully guarded against.

Unless the method of treatment employed represents the value of the injury, that kind of medical sum is better than no sum at all, and is entirely adequate for the purpose of relieving the patient from the financial burden of the accident.



injured workman and his claim for compensation are openly encouraging; and the employers cooperate by providing jobs for the man during the process of rehabilitation, the real end of compensation will not be attained.

*Hospital Records.* On hospital records, in some degree, depend the rights of the injured or of his dependents. Are adequate hospital records available outside of the larger institutions? Do surgeons operating in private hospitals keep proper narratives from which cause and effect might be deduced? What of the surgeon who is permitted to take a case into a large hospital and treat it as a private case, and be free from obligations as to technic and records incumbent upon one with official position? And what of the record kept by the ordinary man as he runs along? Let me ask, is it possible for this body, which has in some measure the control of "medical purse strings," to act in conjunction with the committee of the American Medical Association and with the State societies in furthering this important movement for efficiency?

*Social Service or Follow-up Treatment.* Social service, in conjunction with a compensation board, would bring greater returns for the expenditure than in any other form of medical conservation. As an adjunct to a hospital, service which should investigate the home or lodging to which a man is discharged, to learn why he does not return for treatment; and to aid in bringing treatment to him if he cannot come after it himself. Thousands of dollars are lost to the insuring companies representing the employers, and more thousands are lost to the injured man, by depending upon the impersonal and hurried treatment of the crowded hospital out-patient department. Poorly-kept records, no follow-up treatment, and no end results, mean slow return of wage-earning capacity if full recovery ever comes.

*Institutions for Crippled Workmen.* The methods employed by the warring nations of Europe in restoring the crippled products of war, either for military or civil purposes, contains a great lesson which we may take and apply to the injured workmen in the battles of peace. The modern institution for crippled workmen should be quite a different institution than an institution for the care of the ordinary sick, or for those suffering from ordinary medical illness or surgical disease. We need a combination of the methods found useful in the restoration of children with the surgery found useful in the restoration of adults. Medical specialists, orthopedic mechanics and various classes of artisans and professional people, who should be called upon as teachers, and all of whom should be near at hand and readily available, are essentials. Such institutions should be erected in all large industrial centres. An uncongested locality with plenty of air and sunshine, which has been considered of importance in the treatment of bone tuberculosis and the

diseases of malnutrition of children, is not necessary for adults suffering from industrial maiming. Adequate food, adequate bed facilities, and adequate medical mechanics are more important than sunshine and country.

Orthopedic surgery as a specialty is of fairly recent growth. Up to a comparatively recent time, it was a department of general surgery, and the general surgeon was the man who did the work. With the broadening of the field of the general surgeon, surgery naturally underwent a sub-division, as it was not possible for one man adequately to cover the entire field. Restoration of function in many cases is purely a question of medical mechanics. Is it being properly solved by the surgeon?

The next step in the coordination of educational forces will be to secure the coöperation of all those hospitals and training schools which have been so useful in the care of crippled and deformed children, so that their experiences and plants may be devoted to the reëducation of the injured workmen.

Permanently disabled employees present a distinct and separate problem, which has not yet been met successfully in any state of the Union. In Massachusetts every year, between 400 and 500 cases annually are reported in which the injured employees are incapacitated for work for a period of upwards of one year. During the third year of the Act, 421 such cases were reported, and search finds at least that many cases of permanent partial disability upon the lists of insurers, with many cases running into the second and third years, and some passing through the entire period of 500 weeks during which compensation is payable, if the employee is in fact unable to earn wages by reason of incapacity due to the injury.

It is not a high estimate to place the figures for such incapacity at 421 cases a year, and the rate of compensation at \$8. During the first year of the Act the cost of such cases may be assumed as \$175,136. During the second year the cost must be increased by 50% to allow for cases which have been carried from the first year. This figure is \$262,704. During the third we shall assume that the second year's figures have not been increased and add \$262,704 to the cost of compensation, making a grand total of about \$700,000 for the first three years of the Act. This cost undoubtedly is low and has been purposely kept low for the reason that we do not wish to base our claims upon a false premise.

At least 50% of this compensation cost can be saved by the intelligent supervision of the work of rehabilitating injured employees. The cost for such supervision and the working out of the plan would be low, after the first outlay had been made. Probably it would be self-supporting, and certainly the results would prove alluring to insurers. One-handed and one-armed men, and even the blind, can work, if such work as they can do is furnished them. A thorough canvass of the industrial establish-



ments of the Commonwealth, and the listing of all work that one-armed men can do, will help to reduce the number of such men from the compensation lists of insurers. Work that one-legged men can safely perform also can be listed, and these men can be taken off the compensation rolls and put on the payrolls of the employers of the state. The same process can be followed with one-eyed men, until every possible job suitable for crippled workmen is secured and placed at their disposal. The small balance can be taken in hand and trained in the performance of certain special work, furnished with the very best artificial appliances and made ready for their place in industry.

In countries at war, plans are being worked out for the reëducation of crippled men which can be adapted to our needs here, by the use of the resources which are at hand, and the addition to such resources by the erection and maintenance of plants which shall be used for that purpose.

His Excellency, Governor McCall of Massachusetts, has set the seal of his official approval upon the movement to reduce occupational diseases and accidents to a minimum, and in an especially able message to the Legislature has recommended that all the powers under the existing laws be reposed in the Industrial Accident Board for the accomplishment of this object. If the Governor's recommendations are adopted, the power to direct and enforce safety rules and regulations, and the rate-making power in so far as compensation insurance is concerned, will be under the sole jurisdiction of the Board. His Excellency shows that he has an intimate knowledge of the problems of accident and disease prevention, and that he believes the cost of insurance can be kept down to a reasonable figure by the intelligent control and supervision of this work by a responsible state commission.

When we put the Workmen's Compensation Act into effect, we learned the lesson from the Old World. The principle and administration of it represented at once justice, industrial peace and applied Christianity. It set up a flag of truce between capital and labor, and had the employer and employee join hands in a common cause of good. It incorporated into law the Christian principle that man is more than material, and one of God's creatures, made in his image and with a soul, must be treated in accordance with the dignity of his place in the economy of the universe, and not to be bought and sold and put aside when used up. In carrying out the law, let us arise to the opportunity offered to do good, and care properly for the crippled by-products of industry, just as pathetic and infinitely closer to us than the poor victims of the war across the sea.

Let us see to it that these men, working with us for a common country and a common humanity, are given such care that their broken hands, maimed limbs, shall no longer lead to

despondency or despair, but by our efforts aid in making their hardships and handicaps aids to happiness, and their lives made more useful and contented by being able to work. Massachusetts, through its progressive Industrial Accident Board, has accomplished much. If we can keep true to our ideals, we will delight in more and more satisfaction in knowing we have saved our unfortunates from the misery of idleness, the stigma of pauperism, and the humiliation of dependence.

NOTE.—Dr. Donoghue's remarks were illustrated by fifty lantern slides, showing the re-education schools and the reeducation methods being used for the European soldiers.

## HOSPITALS AND WORKMEN'S INSURANCE\*

By F. J. COTTON, M.D., Boston.

*Visiting Surgeon, Boston City Hospital.*

I do not care to go into the rate squabble between insurance companies and hospitals as such. This matter is unpleasant, and at any rate is not finally settled, nor likely to be for some time. If you wish, I'll tell you what I know of it, out of more experience than I wish, afterward; but first it will be wiser, perhaps, and certainly more pleasant, to consider what the broad general movement for compensation means, and what its relation is to that other country wide movement, in the medical profession, for the furthering of hospital efficiency. This movement is of just about the same age as the Compensation Act in this Commonwealth. Let me hasten to add that I believe these movements in no way antagonistic, but mutually helpful; both details in the march of social progress; both good, however much each may tread on individual prejudices or even rights, at times.

I am afraid that until lately we have not realized certain defects of our hospitals, have not searchingly criticized ourselves—or sought or tolerated outside criticism.

What has been called the manufacturing product—our end results—we have not yet known and this applies to all of us in our activities.

Now comes a Workmen's Compensation Act not previously aimed at its cost to employers but so framed as to make it certain that the provisions are obvious because they are all in the interests of the insured. The bill concerns the insurance covering the cost of a dollar every 40 hours.



nerve involvements are common in limb injuries; that fractures of the spine are not rarely overlooked, if the cord is not damaged.

These things we did not know clearly before, but it was largely not our fault. There was no way we could know; no machinery for getting at end-results available to us. That the present situation helps us in our search for knowledge strikes me as fortunate; not anything to get peevish about.

I wonder how many of you know that our own accident board has promised the fullest co-operation in tracing our end-results, in our cases coming under the Act; even offering services of inspectors in tracing? Or that our superintendent, Dr. Dowling, is having his "Centre" data so gathered and kept, as to be able, presently, to take advantage of this favor? In fact, there is already one investigation going on, soon to be ready, under co-operation of the board and certain members of this and another hospital staff, as to results in one of the less understood classes of injury, above noted.

Certainly no one connected with a hospital wants to give less than the best possible work, under the given circumstances. Now criticism of results proves in fact only rarely criticism of personnel. It is criticism of our hospital methods; of methods partly due to money stringency, but more due to tradition from a time when the hospital did not perform the service to the community that it does today.

Not far back, the hospital was a place for desperate illnesses and courageous surgery. Then if a man got well at all, he asked little as to weeks spent. Now, with the progress toward perfection in medicine and surgery, much that was daring and experimental has become routine. It is no longer notable that an appendix case gets well, or that a hernia holds after operation; it has become, rather, a question why John Smith is not ready for work eight weeks after such an operation, instead of in six, as we have educated folks to expect. And we have not yet perfected our machinery to meet the increased refinement of our practice. We must not only do well by the patient in the operating room, but we must study him beforehand and see him through afterward, until he is fit to go back on the job, if we care to measure up to our new standard of efficiency.

Not a hospital in the country is up to this standard today. This standard means, for one thing, that the medical nursing and other personnel of our out-patients must come up, in the next fifteen years, as much as the personnel and the perfection of work done in our operating rooms has come up in the last fifteen.

None of us can measure up to this standard today, but we can at least see clearly what it is we have to strive toward, and work in the right direction. In order that we may do this, the first requisite is that we should be able to measure our finished product; to know what results we are getting. And I have preached for a good

while that there is no one way of measuring results so definite as the getting of a man back to his normal connection with his weekly pay-envelope. It is just this test that the Workmen's Compensation Act enables us to have, and when we have our results, I think we should rest content to have them stand open to inspection.

There can never be a single fixed standard for all hospitals, public and private, big and little, but if the finished product of all were known and visible, there would be no trouble in knowing how they were fulfilling their function; in making any necessary allowances for difference in the communities and classes and industries served, etc., and in bringing up inefficient units. The difficulty in so bringing up ineffective units is mainly in defective organization, but it is also a matter of men. Hospital service has been, in our time, a matter of volunteer service; the service given has been of the highest quality, but the time for giving it often restricted and sometimes irregular, as must happen in the very nature of the case with volunteer service.

In the development of hospitals along efficiency lines, closer organization will be essential; more method; more clerical, nursing and orderly work; probably a force of young medical men, under salary, combining into a whole machine of some permanency. Dependence upon volunteer student work is already almost a thing of the past.

And here we meet again the Workmen's Compensation Act. All this development means money for hospitals. And workmen's compensation means, or should mean, money for hospitals.

This is another side of the matter. In the past the hospitals, great and small, have devoted themselves to the care and cure of the poor devil, without question of his status. Now he has become a real financial factor, and his restoration to health a real asset to the insurer. We are rendering services to the company as well as to the poor fellow himself, and the company should help; unless, indeed, one can see why the employer should pay the company to cover medical expenses on the one side and contribute on the other, in endowment, gift or yearly contribution, or in taxes, to support a hospital to do the same work. There seems no question about the principle; there is some question about the law, and the insurance companies have, perhaps not unnaturally, been somewhat less than liberal in their desires as to the construction of the law. The argument has been that the hospital always did this work without pay; why not continue? This is specious at best, but the reply is obvious; not only in that it is an injustice to the employing class, as above noted, but also in that new standards are being demanded by the hospitals and their doctors, as well as by the public: that better work means better equipment, and the insurance company, which profits, should pay.



Personally I believe, and most, at least, of our State Accident Board believe that there is a real economy in the end in better work, but owing to difficulties in getting data, this is hard to reduce to figures.

We believe the insurance companies will save money by paying for more and longer care. Many insurance men believe this, too, which is why there was so little opposition to the amendment to the Act I had the honor to prepare two years ago. The amendment is now in effect providing for care continued beyond the two-week limit, in cases unusual and intrinsically serious. This means that the insurer accepts his responsibility for cure and care, as well as maintenance of the injured man, in some cases. The original law contemplated only the two weeks of assured medical care, and that is enough in most cases. Already, however, insurance companies are paying for continued care in many instances; for repair operations later in many others.

In time I trust we shall see them assume all medical care in some form. But we must not be greedy about it. The real obstacle to progress along this line in Massachusetts is the enormous percentage already reached by the medical expense.

### Book Reviews.

*Rules for Recovery from Tuberculosis.* By LAWRENCE BROWN, M.D. Philadelphia: Lee & Febiger. 1916.

This little book, coming from such an authority as Dr. Brown, will fill a distinct want in the literature on this subject. Although several other volumes, for the same purpose, have been written, this book of Dr. Brown's is different, in that it goes into more detail, and discusses the various problems in a less elementary manner than do the others. This very fact leads to the only possible criticism which can be made of this book, in that the class of patients who can really grasp and understand the detailed and scientific advice here given is limited.

At Saranac Lake, this type of patient is, of course, much more common than elsewhere. In large cities, and in the majority of large state or municipal hospitals and sanatoria, the patients whose grade of mentality would enable them to profit greatly by what Dr. Brown has written, are not anywhere near as numerous. For them, shorter books, giving advice and information in a more definite and categorical manner, might be preferred to this of Dr. Brown's. To those patients, however, who can really appreciate what this book contains,—and these naturally are the ones for whom the book is intended,—this volume offers everything that can possibly be desired in the way of a *rad. medium* for consumptives.

The chapter on tuberculin is one with which the average patient has comparatively little concern. The chapter on diet, likewise, discusses the chemistry and physiology of food values in a way which would be quite beyond the majority of patients at any large public sanatorium. The chapter on climate is full of common sense. There is an excellent chapter on the care of children in the homes of the tuberculous. There is an excellent chapter on controlling the cough without drugs. A list of other books and pamphlets on the same or allied subjects, and a detailed index, are valuable additions. On the whole, the book is a very valuable one, not only for patients, but for many physicians to read and study.

*A Textbook of Practical Gynecology for Practitioners and Students.* By D. TOD GILLIAM, M.D., and EARL M. GILLIAM, M.D. Fifth revised edition. Illustrated with 352 engravings, a colored frontispiece and 13 full-page half-tone plates. Philadelphia: F. A. Davis Company. 1916.

This book is now issued in a so-called fifth edition. Strictly speaking it is only a reprint of the fourth edition, for the changes are a name on the title page, an additional date of copyright, a few words in the preface and a few paragraphs in the section on disturbances of menstruation. Otherwise it is almost an exact reprint of the fourth edition, page for page, line for line, letter for letter, but on inferior paper. As a reprint, then, it needs no additional review. It has the same good qualities and the same defects as before, except that if there has been any progress in the past five years, Gilliam's textbook does not contain an adequate account of it.

*Manual of Vital Function Testing Methods.* By WILFRED M. BARTON, M.D., Associate Professor of Medicine, Georgetown University. Boston: Richard G. Badger. 1916.

Prior to the publication of the present volume the literature of functional tests has remained widely scattered in medical journals. In Dr. Barton's work this material is, for the first time, gathered into a single book which deals not solely with the methods of these vital function tests, but with their significance and interpretation. The tests are classified according to the organs whose function is under consideration, namely the liver, kidneys, pancreas, heart, thyroid, suprarenal and intestines. They are classified and their technique described in detail, with a series of sixty fourteen references of the literature from which further details may be obtained. The book would be of value and interest to general clinicians, not to clinicians, as well as to special students of physiology and endocrinology.



# THE BOSTON Medical and Surgical Journal

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## INDUSTRIAL INSURANCE AND WORKMEN'S COMPENSATION.

THE subjects of industrial insurance and workmen's compensation constitute important present points of contact between legislation and the medical profession, since the rights and interest of physicians, as well as those of workmen, insurance companies and employers, are involved in their provisions and application. They are subjects of relatively recent origin, and in their establishment and development certain details have as yet not been satisfactorily adjusted. During the past few years the JOURNAL has from time to time published articles by well-known members of the profession, bearing on various aspects of the problems involved, and has commented editorially upon them, endeavoring always to maintain an open and impartial point of view, seeking only to determine, through discussion, what may be most judiciously fair and mutually advantageous to all the interests concerned.

In the issue of the JOURNAL for September 21 was published, with editorial comment, an article by Dr. Francis D. Donoghue on "Some Medical Aspects of the Workmen's Compensation Act in Massachusetts." In the present issue is published a further article by the same author on "The Restoration of the Injured Employee to Work." Particular attention is directed to a paper by Dr. F. J. Cotton, also published in the present number of the JOURNAL, dealing with certain of the questions which have arisen with reference to hospitals in the administration of the Workmen's Compensation Act. Finally, in the correspondence column of this issue of the JOURNAL, is published a letter from a committee appointed by the Middlesex North District Medical Society to investigate the Workmen's Compensation Act in its relation to the medical profession. This letter gives expression to a growing dissatisfaction on the part of general practitioners of medicine with the application of the Act, especially with its forbidding the injured workman to select his own physician. The letter is earnestly commended to members of the Massachusetts Medical Society, and to other readers of the JOURNAL for careful perusal. There is also published a letter by Dr. Merrill, of Lawrence, criticizing a previous editorial of the JOURNAL on this subject.

The meeting, to which reference is made in the latter part of the former letter, notice of which was published in the issue of the JOURNAL for September 14, was duly held in the Hotel Bancroft, Worcester, at 11 a.m., Sept. 20, and attended by about 75 delegates, from all but one of the districts of the Massachusetts Medical Society, and from the Massachusetts Homeopathic Medical Society. After effecting a temporary organization, the meeting elected Dr. William H. Merrill of Lawrence as its chairman, Dr. George O. Ward of Worcester vice-chairman, and Dr. Joseph A. Mehan of Lowell secretary. After discussing the purposes for which it was summoned, the convention unanimously adopted the following resolution:

"It is the sense of this convention that the Workmen's Compensation Act is unfair to the workmen and physicians of Massachusetts, and should be amended so as to give the injured workman the right to select his physician, surgeon, hospital, or all three, without sacrificing any of the benefits accruing to him under the Act; furthermore, the associations should be responsible for the expenses of medical, surgical



and hospital care during the first two weeks after injury, and, if the employee is not immediately incapacitated thereby from earning full wages, then from the time of such incapacity and in unusual cases, in the discretion of the Industrial Accident Board, for a longer period."

It was also voted that each delegation should report the action and recommendations of the meeting to its district society for consideration, and that a sub-committee of nineteen should be appointed, consisting of one representative from each of the eighteen districts of the Massachusetts Medical Society and one from the Massachusetts Homeopathic Medical Society, to hold further meetings and discussion. The membership of this sub-committee will be announced in a later issue of the JOURNAL, in which it is expected that a more complete report of the proceedings of the meeting will be printed.

It is obvious that there are conflicting interests in the application of the provisions of the Workmen's Compensation Act, but it is our belief that these interests can and will be adjusted and reconciled to their mutual best advantage. The merits of the points at issue are not as yet wholly clear. During whatever discussion and legislative action may ensue, the columns of the JOURNAL will welcome, and will remain freely open to, communications from the various parties concerned; and editorially the JOURNAL will endeavor to maintain a temperate and judicial standpoint, which may facilitate an early and satisfactory settlement.

#### MOTION-STUDY FOR MORE EFFICIENT OPERATING.

Do we need a standard hospital, with instruments and methods based on scientific study, that shall serve as a model to medical students? Magazines and the daily press have told us of Mr. Frank B. Gilbreth, who has been studying the motions of the expert type-setter, the lathe-worker, the pianist, the typist and the surgeon, by means of the stereoscope and the cinematograph. The stereoclinic of Dr. Howard A. Kelly has made the operative technic of various surgeons familiar to the profession. Now comes Mr. Gilbreth in a letter to the September 9 issue of the *Literary Digest*, in which we find these statements:

"After visiting some of our most prominent hospitals, we found that the surgeons could learn more about motion-study, time-study,

waste-elimination, and scientific management from the industries than the industries could learn from the hospitals."

"In studying these many hospitals we find the conditions, as a rule, much worse from an administrative standpoint than in the average factory, and some hospitals are so bad that they should be actually closed immediately."

"The tools of the surgeon have not been standardized in any satisfactory way. Any mnemonic classification made of the tools of a hospital shows that the tool situation is positively pathetic and ridiculous, this present state being the outcome of the incentive which ever exists to design special tools. This condition can be realized only by subjecting the present tools to the tests of motion-study."

"Great practice with comparatively few tools is one of the laws of the most efficient use of tools. How does this compare with the custom universally present in surgery today? The average doctor usually considers that the possession of specially designed tools is a desirable asset. The constant incentive under present conditions in surgery is to design more tools, since the designer receives credit from the public, and sometimes also from his coworkers, and occasionally has the honor of having the new tools named for him. Naturally, the greater the number of tools the less must be the practice with each; the smaller becomes the chance of having a standard tool which is used by all. The general tools of the hospital are by no means as carefully selected as are those of the trades and factories. There should be one central, specially equipped laboratory for measuring, testing, and comparing all new designs with existing standards."

Mr. Gilbreth states further that equipment and surroundings must be subject to the same process, and that motion-study standardization in no way interferes with the other processes of the surgeon or his clinic, and he asserts that even at this early stage of his investigation he can save more than 10% of the time that the patient is under ether in the average operation, without "speeding up" the surgeon. He says:

"How do we determine these motions? We subject them to measurement. First, by dividing activity into its various functions. Then, we number the work of the surgeon, as he does it, among the super-skilled, and it can be determined exactly where motions are duplicated, and which of his motions are to be discarded."



"Having determined exactly what work is necessary, the elements may be combined to show how this work may be done in the most efficient manner. The result is the standard."

The surgeon of experience will recognize in Mr. Gilbreth's plan a step in advance; he remembers how, as a student, he groped in the dark for the essentials of operative technique; how each surgeon had his specially constructed instruments for special operations; how the plan of operating depended on the whim of the operator, rather than on a standard derived from combined experience—individualism rather than common training. Furthermore, the thought has come more than once to the spectator of the operations of the surgical putterer, as the valuable minutes are wasted in the refinements of almost endless minutiae, that the boon of anesthesia to suffering humanity has been sensibly diminished by the overconscientious operator. Better the pre-anesthetic days, when the surgeon was forced to do the absolutely necessary in the shortest possible time.

Obviously, the fit should become the operators, rather than those who decide that operating suits them, or those who detect the rewards lying in that field. One does not like to look back over a long surgical career and remember the bad surgery he has witnessed by the overconfident, the poorly trained and the unfit. If Mr. Gilbreth's motion-study will help to winnow out the superskilled so that they may be recognized by all it is to be welcomed by the profession.

#### LEGISLATION ON POLIOMYELITIS.

DURING the past week the epidemic of poliomyelitis has continued to decrease in New York and New Jersey, and has remained essentially stationary in New England. On September 23, the number of cases in New York City reached a total of 8885 with 2233 deaths. In New York State, outside New York City, the number of cases on September 22 reached a total of 3087 with 551 deaths.

In Illinois, from July 1 to August 31, 415 cases with 38 deaths were reported, and in New Jersey, from August 29 to September 5, 401 cases were reported. The total number of cases in New Jersey since June 30, 1915, is 2,878.

In Massachusetts, on September 24, the number of cases since September 1, reached a total of 424,—34 more than were reported during the first eight months of 1916. Outside of Boston

the largest number of cases is in Holyoke, where on September 24 there were 60 cases, of which 42 had occurred since September 11. There are cases in every one of the 36 cities of Massachusetts except Attleboro, and in 149 of the 318 towns. In the 1910 epidemic 153 towns were involved. The opening of Boston schools has been postponed to Oct. 2. In Rockland, Me., on September 16, 25 cases and 11 deaths had been reported. There have been 683 cases in Connecticut, 101 in Rhode Island.

In Massachusetts, on September 14, Governor McCall sent to the General Court the following message calling the attention of that body to the necessity of legislation empowering local boards of health to establish quarantine measures against poliomyelitis and recommending the passage of an emergency measure to provide such authority.

"It has come to my attention that there is doubt whether the power of the boards of health to quarantine against a spread of communicable diseases is sufficiently strong to enable them to take measures which may be necessary to check the spread of the disease known as infantile paralysis. While I am informed that the general subject of extending powers of boards of health with reference to communicable diseases has been the subject of investigation by legislatures and may require more careful study than can be given at this time, I think that as an emergency measure, to aid in checking the spread of infantile paralysis, the powers of boards of health, if not adequate, should be enlarged until such time as the danger of an epidemic during the present year shall have passed, or until the next Legislature shall have had an opportunity to study more carefully and pass upon the subject in question.

I recommend the passage of legislation to that end."

From the Committee on Public Health, Senator Clark of Brockton forthwith reported a measure known as the Bates Bill, based on the Governor's recommendation. This bill was immediately passed to be engrossed and was promptly signed by the Governor. The text of the Bates Bill is as follows:

"Section 1. Boards of health in cities and towns, or boards of selectmen in towns, may make such rules and regulations as are necessary and proper to check the spread of the disease known as infantile paralysis, and to cause its eradication by quarantine or otherwise.

"Section 2. The state department of health shall have the power to revoke or revise any such rules or regulations when they are unnecessary or unreasonable, and all such rules or regulations shall not have force or effect after Jan. 15, 1917."



Apprehension has been expressed in certain quarters that the increasing number of cases of poliomyelitis in Boston may overtax the capacity of local hospitals. As a matter of fact there seems little likelihood of this contingency, but should it occur, there is possibility of adequate accommodation by employing the facilities of the quarantine station at Galloupe's Island which have been offered to the city by Dr. S. B. Grubbs of the United States Public Health Service in the following recent letter:

"When the epidemic of infantile paralysis first began in New York City, I called at the city health department and offered the use of the hospitals on Galloupe's Island to the limit of our capacity (eighty beds), in case they should be needed. In view of the increased number of cases in Boston, I wish to renew this offer to you. As per the existing agreement and my official instructions, these cases will be taken at \$1.00 per day, the city to furnish a sufficient number of nurses.

It will be possible also for us to take care of a considerable number of contacts, or members of the patients' families, if this is desired by the health department, and for these the charge would be the actual cost of provisions furnished, plus twenty-five per cent., which would not be over fifty cents per day."

### MEDICAL NOTES.

**BUBONIC PLAGUE AT BRISTOL.**—In the issue of the JOURNAL for September 7, we noted the recent occurrence of three cases of bubonic plague at Bristol, England. The weekly report of the United States Public Health Service for September 8, notes the occurrence of two further cases of plague at Bristol, and one at Hull, England.

**VENEZUELAN LEPROSARIA.**—The weekly report of the United States Public Health Service for September 8 contains the following note on leprosy in Venezuela.

"Two leprosy hospitals are in operation in Venezuela. The larger is on the isla de Providencia, situated just outside of the harbor of Maracaibo. It can accommodate 700 persons, is provided with steam laundry and steam apparatus for disinfection of clothing and bedding, and is in charge of a corps of physicians and nurses. The lepers received represent every class and period of life, and every stage of invasion of the disease. They are segregated in the several States of Venezuela as they are admitted, and later removed to the isla de Providencia.

At the beginning of the year 1914 there were 400 inmates at the leprosarium, and during the year 233 were received. During the same period 10 patients were discharged apparently cured.

The leprosarium at Cape Blanco, situated about 4 miles from La Guaira and Maiquetia, was formerly operated to its full capacity of 400 persons, but was later closed. It is now used as a temporary leprosarium for lepers from the vicinity, who are there cared for until transferred to the isla de Providencia."

**AMERICAN ASSOCIATION FOR CLINICAL RESEARCH.**—The eighth annual meeting of the American Association for Clinical Research is to be held in New York City on September 28, 29 and 30, under the presidency of Dr. Daniel E. S. Holman of New York. The secretary of the Society is Dr. James Krauss of Boston.

### EUROPEAN WAR NOTES.

**AMBULANCE FOR RUSSIAN RED CROSS.**—Report from Petrograd, by way of London, states that on Sept. 20, a motor ambulance was formally presented to the Russian Red Cross by American and English women resident in Petrograd. The ambulance was sent to the front on Sept. 21.

**WAR RELIEF FUNDS.**—On Sept. 23 the totals of the principal New England relief funds for the European War reached the following amounts:

Secours National Fund .....	\$213,156.67
Belgian Fund .....	153,171.79
French Wounded Fund .....	120,320.00
Armenian Fund .....	66,772.10
French Orphanage Fund .....	62,580.19
Polish Fund .....	43,979.67
Belgian Tobacco Fund .....	37,104.09
Italian Fund .....	25,153.54

### MEXICAN NOTES.

**ARMY HOSPITAL TRAIN.** Report from Hot Springs, Ark., states that on September 10 the United States Special Army Hospital Train arrived at that city, bringing from Fort Houston, Texas, 151 sick guardsmen and regulars from the Mexican border to the Army General Hospital at Hot Springs.

**ARMY MORBIDITY STATISTICS.** Report from Washington, D. C., on September 11, states that for the week ended September 9, the percentage among National Guardsmen at the Mexican frontier was only 1.91 with 106 deaths, one each from appendicitis, pneumonia and gastric ulcer. For the preceding week morbidity was 1.92 with no deaths. As for regular troops the corresponding figures were 2.15 with four deaths and 284 deaths.

**TYPHUS AND YELLOW FEVER.** Report from Washington, D. C., on September 11, states that there has been no reported case of typhus or yellow fever in the United States since the amount of cases in the United States. At the same time, the report states that the percentage of rigid gastroenteritis in the United States is being observed.



## BOSTON AND NEW ENGLAND.

**THE WEEK'S DEATH RATE IN BOSTON.**—During the week ending Sept. 23, 1916, there were 229 deaths reported, with a rate of 15.70 per 1000 population, as compared with 171 and a rate of 11.91 for the corresponding week of last year. There were 51 deaths under 1 year, as compared with 46 last year, and 55 deaths over 60 years of age, against 44 last year.

During the week the number of cases of principal reportable diseases were: measles, 8; diphtheria, 45; scarlet fever, 15; typhoid fever, 12; whooping cough, 13; tuberculosis, 60.

Included in the above were the following cases of non-residents: diphtheria, 16; scarlet fever, 4; tuberculosis, 4.

Total deaths from these diseases were: diphtheria, 3; scarlet fever, 1; tuberculosis, 22; whooping cough, 2.

Included in the above were the following deaths of non-residents: diphtheria, 1; scarlet fever, 1; tuberculosis, 1; whooping cough, 1.

**EVENING CLINIC FOR DISEASES OF THE NOSE, THROAT AND EAR.**—The Boston Dispensary opened on September 25 an evening laryngological clinic, under the direction of Dr. H. J. Juglis. A small charge is made in order that the clinic may be self-supporting. The dispensary now maintains evening clinics for eye diseases, genito-urinary diseases, and a dental clinic.

**GRADUATION OF NURSES AT BROCKTON HOSPITAL.**—The Brockton Hospital, on September 14, graduated from its training school seven nurses. Dr. David Seannell of Boston made an address.

**FLOATING HOSPITAL.**—The last trip of the season of the Boston Floating Hospital was made on September 16. Patients too ill to be discharged were transferred to other hospitals. In the evening graduating exercises were held and 45 nurses were given diplomas.

**HOSPITAL BEQUESTS.**—By the will of the late Lyra Brown Nickerson of Providence, R. I., the Rhode Island Hospital has received a bequest of \$5000.

The will of the late Mrs. Henry Augustus Turner, of Brookline, Mass., which was filed on Sept. 19 in the Norfolk Probate Court at Dedham, Mass., contains bequests of \$5000 each, for a free bed, to the Portsmouth (N. H.) Hospital and the Children's Hospital, Boston.

### Miscellany.

#### RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS FOR AUGUST, 1916.

INFANTILE PARALYSIS has overshadowed in interest all other communicable diseases during

the month of August. Another striking fact is the sudden drop in the number of cases of measles being reported.

**Prevalence.** Communicable diseases were reported in slightly greater numbers during August, 1916, than during the same month in 1915. However, there was a marked drop in the total of reported cases of diseases dangerous to the public health, as compared with July, 1916. This was due to the sudden cessation of the epidemic of measles, which has been prevalent in the State for some months.

The following figures will be of interest:

MONTH	YEAR	TOTAL CASES REPORTED	CASE INCIDENCE PER 100,000 POP.
July	1916	5728	154.5
August	1916	3143	85.0
August	1915	2883	78.0

**Measles.** There has been a marked decrease in the number of cases of measles reported during the month. This seems to be the usual phenomenon. During July, 1916, there were 2713 cases reported, while in the month just closed there were only 595. As compared with August, 1915, this disease was considerably more prevalent this year.

Comparative table follows:

MONTH	YEAR	TOTAL CASES REPORTED	CASE INCIDENCE PER 100,000 POP.
July	1916	2713	73.3
August	1916	595	16.1
August	1915	370	10.0

The following cities and towns have exceeded their endemic index for the month of August:

(Endemic index signifies the average for five years of reported cases exclusive of epidemics. This index is applied to each city and town for each month for every communicable disease.)

Amherst .....(1) 8	Malden .....(3) 13
Cambridge .....(6) 24	Newton .....(2) 15
Fitchburg .....(1) 34	North Adams .....(1) 60
Lowell .....(12) 57	Somerville ....(2) 15
Leominster ....(1) 15	

**Diphtheria.** Diphtheria showed a slight decrease during the month of August, as compared with the previous month, and a considerable decrease as compared with August, 1915. Ludlow has had a sharp outbreak of this disease during the month, while the number of cases reported from Fitchburg is well above the average. Comparative table follows:

MONTH	YEAR	TOTAL CASES REPORTED	CASE INCIDENCE PER 100,000 POP.
July	1916	495	13.4
August	1916	460	12.4
August	1915	564	15.3

The following cities and towns have exceeded their endemic index for diphtheria:

Fitchburg .....(5) 24	Reading .....(0) 10
Lawrence .....(3) 10	Watertown .....(1) 18
Lowell .....(7) 18	Westfield .....(0) 7
Ludlow .....(0) 26	

**Whooping Cough.** The number of cases of this disease reported during the month is smaller, both in comparison with August, 1915, and with July of this year. Comparative table follows:







Reading .....	1	Wareham .....	4
Revere .....	4	Whitman .....	1
Savoy .....	1	Webster .....	1
Salem .....	5	West Blyston .....	1
Southwick .....	1	Worcester .....	5
Springfield .....	17	Yarmouth .....	1
Somerville .....	8	Barre .....	1
Stoughton .....	3	Charlton .....	2
Southbridge .....	4	Launcester .....	1
Taunton .....	1	North Brookfield .....	1
Uxbridge .....	2	Leominster .....	1
West Springfield .....	1	Sturbridge .....	1
Westfield .....	3		

**Mortality.** There were 39 deaths reported to this Department from anterior poliomyelitis during August. This gives a fatality rate of 15.2%. While the returns of deaths upon which these figures are based are admittedly incomplete, it indicates that the infection is of an unusually virulent nature.

**Investigation.** The State District Health officers and the epidemiologist, working in co-operation with the local health authorities, are making a study of all reported cases. The detailed result of these studies will be published later in the year.

**Typhoid Fever.** During the closing days of August there was a sharp outbreak of typhoid fever reported from Lynn. The early results of the investigation show that the mode of transmission was undoubtedly milk. All of the cases occurred on a single milk route.

## Correspondence.

### "A SQUARE DEAL TO ALL."

LOWELL, MASS., September 5, 1916.

Mr. Editor: There has, for a long time, been a growing dissatisfaction with the application of the Workmen's Compensation Act. This dissatisfaction, at the annual meeting of the Middlesex North District Medical Society in April, 1916, seemed to come to such a climax that there arose a general demand for an investigation of the act in its relationship to the medical profession. Pursuant to this idea, there was appointed at this meeting a committee to investigate the status of the physicians under the act. This committee found that the act was passed by the Legislature of 1911. They also found that Section V, of Part II, which is as follows:

Part II, Section V. During the first two weeks after the injury, the Association shall furnish reasonable medical and hospital services, and medicine, when they are needed,

allowed the injured workman to select his own physician when he so desired. We mean by this not that the act specifically gave him his right, but rather that it did not specifically deny him the right.

The committee found further that this act was amended in 1914, in such a way as to preclude all possibility of free choice of physician on the part of the workman injured, except in case of grave emergency, and as to whether or not any situation in which the workman might find himself, represented an emergency, not he, but the Industrial Accident Board, sitting on the case probably months afterward, must decide. Section V, of Part II, of amended

act of 1914, again the section that relates to medical services, reads as follows:

Part II, Section V, is hereby amended by striking out Section V, of Part II., and inserting in place thereof the following new section:

Section V. During the first two weeks after the injury, and if the employee is not immediately incapacitated thereby from earning full wages, then from time of such incapacity, and in unusual cases, in the discretion of the Board, for a longer period, the Association shall furnish reasonable medical and hospital services and medicines when they are needed.

Where, in a case of emergency or other justifiable cause, a physician other than the one provided by the Association is called in to treat the injured employee, the reasonable cost of his services shall be paid by the Association subject to the approval of the Industrial Accident Board. Such approval shall be granted only if the Board finds that there was such justifiable cause and that the charge for the services is reasonable.

This committee concluded, first from a perusal of the original act of 1911 and the amended act of 1914, and also from an interpretation of the act as presented by Justice Carroll of the Massachusetts Supreme Court, that the Workmen's Compensation Act works to the unfair advantage of the medical profession.

A special meeting of the Middlesex North District Medical Society was called on June 14th, to hear the report of its special committee. The committee reported the situation as outlined above with recommendations which were as follows.

1st. That an endeavor be made to so amend the Workmen's Compensation Act as to give the injured workman the right to select his physician.

2d. That every District Medical Society in Massachusetts be invited to co-operate with the Middlesex North District in an endeavor to bring relief to this situation.

3d. That the Massachusetts Homeopathic Society be invited also to co-operate.

The original declaration as to the unfairness of the law and these recommendations were accepted unanimously and this committee was given full authority to carry on the work.

Immediately the committee got in touch with every district society in the state by means of the following letter which is self-explanatory:

Secretary of . . . . District Medical Society.

Dear Doctor: This committee was appointed at the annual meeting of the Middlesex North District Medical Society, to investigate the Workmen's Compensation Act in its relationship to the medical profession, because of the marked dissatisfaction with the Act as it now stands.

This committee found that the insurance companies have the sole right to name the attending physician and that the workman has no voice in the selection of the physician who is to attend him, provided that he wishes to receive all the benefits of the Act.

We made recommendations to our Society which were accepted and we were given full power to proceed with the work.

We are of the belief that relief from these unfair conditions is to have the Workmen's Compensation Act so amended, that the injured workman may select his physician without sacrificing any of the benefits of the Act.

It is suggested, in order to bring this about, that each district society appoint a like committee of five, and the large committee thus formed is to meet in Worcester, at Hotel Ram-



croft on Sept. 20, 1916, there to discuss freely the matter involved, and to formulate a plan of active campaign for the relief measure.

Will you, in furtherance of this object, let us send a representative to the next meeting of your district society that we may explain in more detail the plan of action we have in mind for the relief of this situation?

This committee will appreciate a reply at your earliest convenience, in enclosed stamped envelope, and would thank you to state the date, hour and place of your next meeting, which we understand is in July.

We are,

Very truly yours,

COMMITTEE ON WORKMEN'S  
COMPENSATION ACT.

*Middlesex North District Medical Society.*

It was a source of great gratification to the committee to note how widespread was the interest in this matter. The responses to this circular letter were enthusiastic and displayed an eagerness to co-operate. When a reply was received giving the date of the mid-summer meeting, the following letter was sent to each member of the district society:

*Dear Doctor:* Our request for a like committee from your district is to be considered at the next meeting of your district medical society.

#### THE CAUSE.

We address you personally with the hope that you are interested in the Workmen's Compensation Act to the extent that it shall be fair not only to the workman, but also to the insurance associations and to the medical profession. We feel that in its present state, it works to the unfair advantage of the physician and his patient.

#### THE EFFECT.

*First*—it diverts, in many instances, patients and even their families from the care of their physician.

*Second*—It forces patients who have every confidence in their regular physician to accept the services of another who may not be known to them, provided they wish to avail themselves of all the benefits of the Act.

There is no doubt that the service offered by the insurance associations is good, but it is positively no better than the workman himself could and would select.

We have no quarrel with the insurance companies, none whatever with the members of the medical fraternity who are doing the work, but we believe that any act which deprives John Smith, a human being, of his divine right to select his attendant when either accident or sickness befalls him, is grossly unfair—no matter who pays the bill.

#### THE REMEDY.

The remedy, it seems to us, is to have the Workmen's Compensation Act so amended that the injured workman may select his physician without sacrificing any of the benefits of the Act.

We ask you to attend the next meeting of your district medical society there to join in the discussions of this subject.

Our committee would be grateful if you could reply to this communication, but if you cannot, please attend the meeting as asked.

We are,

Yours very truly,

COMMITTEE ON WORKMEN'S  
COMPENSATION ACT.

*Middlesex North District Medical Society.*

All of the districts holding mid-summer meetings were visited by members of the committee, and the work explained in detail.

These men were universally well received, respectfully listened to, and on the instant it was apparent that they had struck a responsive chord. The plan as outlined to the various districts is as follows:

A convention will be held in Worcester, Sept. 20, 1916—this convention to be made up of representatives from every district medical society in the state and from the Massachusetts Homoeopathic Society; this convention to take up the work and carry it to its successful issue.

The various districts have thought so well of this plan that they practically all at this time have appointed representatives to sit in this convention.

The committee from Middlesex North District found that many of the cases coming under the Workmen's Compensation Act were being cared for in the charity wards of the various hospitals of the district, that is, a nominal sum was being paid the hospital for the board and nursing of these cases, but the staff physicians were receiving absolutely no recompense for their services.

This committee, at no angle from which they might view the situation, could see these cases in the light of charity cases, and consequently concluded that the men rendering the service were having their services commended under false pretenses.

The committee got in touch with the trustees and superintendents of the hospitals, pointed out to them the unfairness of the situation, which they quickly saw, and gladly gave the committee a written statement that henceforth these cases must be looked upon as the private cases of the physicians rendering the service. The consequence of this is that today in Lowell all physicians are being paid for all those hospital cases coming under the Workmen's Compensation Act.

We feel that the demands of the physicians of Massachusetts are so reasonable that they will meet with the same degree of success before the Massachusetts Legislature as we in Lowell met with in our dealings with the officials of our hospitals.

We are sure that all that is necessary to bring the desired change about is a united stand by the physicians throughout the state.

Respectfully yours,

M. A. TOWN, M.D., *Chairman*  
J. A. MEEHAN, M.D., *Secretary*

#### THE VIEWPOINTS

LAWRENCE, MASS., Sept. 22, 1916.

*Mr. Editor:* The closing sentence of an editorial discussing the relations of the physician to the Workmen's Compensation Act in the *JOURNAL* of Vol. 27, 1916, reads as follows:

"The court decision will leave the test of work independent physicians entitled to their ordinary similar services to employees, if once they have passed this sort of insurance."

If there is no doubt concerning the right of independent physicians to their ordinary services, this sentence means that the Workmen's Compensation Act of the Massachusetts Medical Society, members of the Society are not to be considered as people who are interested in the compensation of their services unless they are doctors who are not members of the Society. This is a very serious statement, and it is paid for the service of the physician.

In the editorial, it is stated that the Workmen's Compensation Act is a very serious statement, and it is paid for the service of the physician. It is a very serious statement, and it is paid for the service of the physician.

For the purpose of the Workmen's Compensation Act, it is a very serious statement, and it is paid for the service of the physician. It is a very serious statement, and it is paid for the service of the physician.



frères to refuse to treat patients of theirs because they might not be paid for their services. The failure to appreciate that injured employees and the doctor in the industrial centre can have the same intimate personal relation that the patient and doctor enjoy among the wealthy classes, is the reason this advice is offered. Injured employees receiving ten to twenty dollars a week are simply out-patient department material in Boston, but they are not that in poorer communities, and it is not possible for them to be so considered. The physician in wealthy medical centres can and does recoup for himself through charges to his wealthy patients remuneration for the hours spent in the out-patient. Such a system is workable where the percentage of patients in a community able to pay is sufficiently large, which it is not in industrial centres.

It is my impression that the supply of doctors is not now excessive, for it is necessary to consider the demands of the epidemic seasons. If this supply is to be maintained for the use of the general community, it is necessary that the remuneration be sufficiently large to attract competent men.

If it is thought or said that these employees of small income should not be expected to pay for medical attendance, I agree; but it must be remembered that the surgeon in the medical centre who gets five hundred dollars for operating on a stockholder or well paid official of an industrial plant, gets his fee from the same source as Dr. X who gets a small fee for treating the employee. In the first instance it has simply passed through the hands of one more person.

Yours very truly,

W. H. MERRILL, M.D.

#### PYORRHEA ALVEOLARIS AND ITS TREATMENT

WESTPORT-ON-LAKE-CHAMPLAIN, N. Y., Sept. 14, 1916.

MR. Editor: In view of your editorial in your issue of September 14, 1916, I would direct your attention to an article by me on this subject in the August number of *American Medicine*. In it, I state that I have found Dr. Augustus B. Wadsworth's mouth wash of very great value when other methods of treatment have notably failed. I believe you will render service to many sufferers from the disease, by directing attention of physicians to my article and to the statement referred to.

BEVERLEY ROBINSON, M.D.

#### NOTICE.

THE HENRY S. WELLCOME PRIZES, OFFERED THROUGH THE ASSOCIATION OF MILITARY SURGEONS, viz: First prize, a gold medal and \$300.00; second prize, a silver medal and \$200.00. Open for competition to all present and former Medical Officers of the Army, Navy, Public Health Service, Organized Militia, U. S. Vols., Medical Reserve Corps of the Army, Navy and of the officers Reserve Corps of the U. S. Army, will not be awarded until after December 15, 1916, the Council of the Association having voted to extend the time of entry of competing essays to that date, because so large a number of the members are now with the troops on the Border.

Several essays have already been received and a large additional number are expected to be entered for such honorable and valuable prizes. The subject for the first prize is "The most practicable plan for the organization, training and utilization of the Medical Officers of the Medical Reserve Corps, U. S. Army and Navy and of the Medical Officers of the Officers Reserve Corps, U. S. Army, in peace and war."

That of the second prize is: "The influence of the

European War on the transmission of the infections of diseases, with special reference to its effect upon disease conditions of the United States."

Essays (5 copies signed by *nom de plume*) not to exceed 20,000 words, exclusive of tables, must be addressed to the Secretary of the Association of Military Surgeons, U. S. Army Medical Museum, Washington, D. C.

#### SOCIETY NOTICE.

SUFFOLK DISTRICT MEDICAL SOCIETY.—The members of the Society have been cordially invited by the Boston district of the Massachusetts Homeopathic Medical Society to attend a meeting of that Society on Thursday evening, October 5, at 8 o'clock, at the Evans Memorial Building, East Concord Street, Boston.

Dr. McLaughlin, Commissioner of Health, will speak on Anterior Polymyositis. It is hoped that many members of the Suffolk District Medical Society will be able to accept this invitation.

DAVID CHEEVER, Secretary,  
Suffolk District Medical Society.

#### APPOINTMENT.

DR. L. D. BRISTOL, Professor of Bacteriology and Hygiene, and Director of the State Public Health Laboratories at the University of North Dakota, has accepted the newly created Boston Dispensary Fellowship in Public Health in the Department of Preventive Medicine at the Harvard Medical School, Boston.

#### RECENT DEATHS.

DR. SANFORD HANSCOM died at his home in Somerville, September 20, aged 75 years. He was born in Albion, Me., January 28, 1841, and was educated at Colby College and at the Harvard Medical School from which he graduated in the class of 1868, previously having served in the Civil War. Dr. Hanscom was a member of the Somerville school board for 17 years and was a trustee of the public library. He was a member of the American Medical Association, of the Massachusetts Medical Society, of the Loyal Legion, and of the Royal Arcanum. He is survived by a widow and a daughter.

DR. WYLLIS GILBERT EATON died at his home in Lowell, June 26, 1916, aged 62 years, of coronary sclerosis. He was born in Lawrence, February 23, 1854, was a graduate of Dartmouth College in the class of 1875, and of the Harvard Medical School in 1879, settling in Lowell and joining the Massachusetts Medical Society in that year. He was visiting physician to the Lowell Hospital, and until May, 1916, was Councilor and Supervising Censor of the Middlesex North District Medical Society, of which he had previously been secretary and president.

DR. JOHN JOSEPH THOMPSON died at his home in Webster as a result of cerebral hemorrhage, September 16, aged 56 years. He was born in Webster, attended Nichols Academy in Dudley, graduated from Holy Cross College, Worcester, in 1882 and from Jefferson Medical College, Philadelphia, in 1887. He was town physician for 15 years and was chairman of the school committee for 10 years, one of the recently built schoolhouses of the town having been named for him. He was a member of the following societies: American Medical Association, Massachusetts Medical Society, Connecticut State Medical Society, Webster Council of Knights of Columbus, Ben Franklin Council Royal Arcanum. He is survived by a sister.



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more than a student; he is an indefatigable worker, a seeker after knowledge for its own sake,—knowledge in advance of others and also knowledge of what men have known before him. There must also be a certain bookish flavor about him before we can call him a scholar. He must be a student of his profession and he must love its literature. We can hardly conceive such a man who does not also love the literature of all the ages. He loves books and treasures them. He appreciates Cicero's tribute to liberal studies in his plea for the poet Archias: "For other occupations are not suited to every time, or to every age or place; but these studies are the food of youth, the delight of old age, the ornament of prosperity, the refuge and comfort of adversity; a delight at home and no hindrance abroad; they are companions by night and in travel and in the country."

Scholarship is unselfish, seeks knowledge for its own sake and takes pleasure in imparting it; it seeks to make experience profitable. A medical scholar makes the bitter experience of disease and death conduce to the good of future days, for the human body is his most treasured book, with all its wondrous revelations.

Doubtless there are medical scholars who are recluses, who are content to pore over the records of the past, who know the physicians of the older days better than those of the present. Perhaps to many, the title of medical scholar would attach to them alone, but they deserve to be classed as misers who are content with the accumulation of literary riches. To me, the medical scholar is more likely to be also a man of action than the scholar in any other branch of learning. With so loose and liberal a definition, it is not easy to distinguish between the practitioner and the experimenter, the research student and the scholar; nor is it necessary for the present purpose.

The learning of medical scholars, as shown in their writings, reflects the spirit and the frailties of the age in which they lived. Their character varies with the advance of learning. Sometimes they discuss secular or religious, sometimes special medical topics, often they blend the three. Perhaps they are at their best when they record the things that have occurred under their observation, preserving for us the history of epidemics and prevailing diseases, or even the story of a single life.

The patron saint and godfather of so many hospitals, Saint Luke, we may look upon as the earliest medical scholar of the Christian Era. He is known to us better as a sacred historian than as a physician, but it is his narrative of our Lord's life which has preserved the stories of the healing of the sick and the raising of the dead, and the story of the good Samaritan who succored the wounded man while others passed by on the other side, and whose use of oil and

wine foreshadowed the present use of alcohol as a surgical dressing.

However one may regard those miraculous events, the narratives show the interest of the writer in the sick and the suffering, very much as a physician of the present day, writing a history which involved questions of life and death, health and disease, would be likely to dwell a little more fully than a non-medical historian, upon those matters.

It would be an endless task to trace the medical scholar from that day to our own, but coming down to a nearer period and confining our attention to men of English birth, one can scarcely avoid the mention of Sir Thomas Browne. His *Religio Medici* is an object of study for students of general literature and his urn burial has especially interested the advocates of cremation. One of his books was entitled *Pseudodoxia Epidemica*, or a Treatise on Vulgar and Common Errors, in which he rebuked the superstitions of the day; but he, himself, shared the current belief in witchcraft and gave testimony at a trial of two unfortunate, alleged witches which probably tended to their conviction.

Dr. John Halle has left us a poem more simple and direct in its diction than the writings of Sir Thomas Browne, but its value today is as great as in the sixteenth century when he wrote it.

"When thou arte calide at anye time  
A patient to seee  
And doste perceave the cure to greate  
And ponderous for thee

See that thou laye disdeyne aside  
And pride of thyne owne skyle  
And think no shame counsell to take  
But rather wyth good wyle

Gette one or two of experie men  
To helpe thee in that nede  
And make them partakers wyth thee  
In that worke to procede.

But one thing note when two or more  
Together joyned be  
Aboute the paynfull patient  
See that ye doe agree.

For naughte can more discomforte him  
That lies in griefe and payne  
Than heare that one of you dothe beare  
To other such disdeine.

Wherefore what so ye have to saye  
In things about your arte  
Let it be done among yourselves  
In secrete and aparte.

With one consent uniformlye  
Comforte the wounded man  
But unto some good friend of hys  
Express alle that ye can

See thou dispraise none other man  
His error tho' thou knowe  
For sure another for thy plague  
Shall thee like curtyse showe."



fore, formed in cold climates *because* the cold air is denser than warm air, and a greater amount of oxygen per unit of volume comes in contact with the surface of the lung.

But Lavoisier's writings contain also the germ of the truth.

In his communications of 1789, he states that, in spite of what should be expected, experiments with guinea pigs demonstrate that these animals take up the same amount of oxygen, and give off the same amount of carbon dioxide, whether they breathe pure oxygen or a mixture of oxygen and nitrogen. Lavoisier was already, therefore, on the right track. By 1789, he had overcome the technical difficulties of constructing apparatus for carrying out metabolism studies even in man; by 1791, one of his pupils, Seguin, had developed a method of measuring the amount of oxygen in a mixture of gases (measuring how much of the gas would combine with phosphorus<sup>20</sup>); and another pupil, Hassenfratz, by showing that the temperature in the lungs is no higher than elsewhere in the body, had corrected the erroneous notion that the oxidation takes place in the lungs. It is highly probable, therefore, that Lavoisier might soon have carried out experiments that would have anticipated a century of errors. But scientific work was interrupted by the French Revolution, and Lavoisier himself was executed early in 1794.

From the death of Lavoisier until 1866 there was but little change in views held by physiologists regarding oxidation. Certain investigators,—Regnault and Reiset<sup>21</sup> (1849), Müller<sup>22</sup> (1858),—as a result of experiments similar to those of Lavoisier, pointed out that the activity of the metabolism remains unaffected by the oxygen tension. But these experiments made little impression at the time.

Reform came from another quarter. Almost inextricably involved with the incorrect notion regarding the cause of oxidation was an incorrect idea concerning the place of oxidation. Oxidation was believed to take place, not in the tissues, but in the blood-stream. It was the gradual accumulation of data not in harmony with this latter belief, and indicating that oxidation takes place in the tissues, that led to a readjustment of the views regarding the cause of oxidation.

It is difficult to determine precisely who should be given credit for teaching us the truth regarding this matter. The question of the cause of oxidation and that of the place of oxidation—though two separate questions—are not clearly separated in the early discussions. The question arises not only: Who first taught the

truth as a matter of belief, but also: Who first experimentally established the facts upon which the truth could be based? The echoes of the fierce polemics of the '70's over these questions have not yet died out.

In 1838, Müller stated clearly<sup>23</sup> that oxidation does not take place in the blood, but in the tissues; he believed, however, that the respiration is not the result, but the cause, of the oxidation. In 1844, Vierordt stated correctly the facts of internal respiration<sup>24</sup>; that oxidation takes place in the tissues; and that the blood transports oxygen to the tissues, and takes carbon dioxide away from the tissues. Experimental confirmation of these hypotheses was furnished by L. Meyer in 1857<sup>25</sup>; Meyer demonstrated that the blood transports both carbon dioxide and oxygen.\* A further confirmation of this theory was furnished in 1863<sup>26</sup> when Panum showed that the amount of oxygen absorbed by dogs and the amount of carbon dioxide given off is not affected by the great loss of transporting power for oxygen which results from severe hemorrhage. In the subsequent polemics, these writers are given little credit; Pfliiger, indeed, in 1868 rejected Meyer's conclusions.<sup>27</sup>

Voit was probably the first<sup>28</sup> 1866 to incline physiologists to the belief that respiration is not the cause of metabolism, but the result of the needs of the metabolism. He pointed out that the carbon dioxide eliminated is independent of the ventilation of the lungs.<sup>29</sup> In 1868 he showed that neither by section of the vagus, formation of a pneumothorax or by hemorrhage, whereby respiration is diminished, can the amount of oxygen taken up or the amount of carbon dioxide given off be influenced.<sup>30</sup> In 1869 he showed that in leukemia a disease which was believed to be associated with diminished internal respiration<sup>31</sup> neither the oxygen intake nor the carbon dioxide output is affected. In the same year, Senator searched in vain for evidence of incomplete oxidation in dogs, cats, and rabbits after binding the thorax tightly.<sup>32</sup> In 1870 and 1871, Voit<sup>33</sup> discussed the whole subject at great length and answered especially the objections of Liebig who was teaching the old view.

Hoppe-Seyler accepted the new theory at least from the beginning, but did not furnish any experimental proof was complete until 1878.<sup>34</sup>

At first 1866-1868, Pflüger, who was then working on the gasometry of blood, strenuously opposed the new view.<sup>35</sup> In 1868 he stated: "No one will deny that in the blood that oxygen is continuously used up in the blood vessels," and described experimentally the "con-

<sup>20</sup> In 1780 Lavoisier demonstrated this apparatus to the members of the Academy, and in his communication described the main features of it; he promised to publish later a detailed description. In 1790 he again promised to describe this apparatus. I have searched for this promised report in probable places but have never been able to find it.

<sup>21</sup> The memoirs of the French Academy for 1790 were not published until 1797. A note of strong warning was issued in 1820, in that year. The intervening years are not mentioned. The Academy was suppressed in 1793.

<sup>22</sup> *Annales de Chimie*, 1858, 32, 125. The paper is a translation of the original German.

<sup>23</sup> *Annalen der Chemie*, 1838, 241, 125. The paper is a translation of the original German.

<sup>24</sup> *Annalen der Chemie*, 1844, 267, 125. The paper is a translation of the original German.

<sup>25</sup> *Annalen der Chemie*, 1857, 227, 125. The paper is a translation of the original German.



and similar ones by Schmidt in Ludwig's laboratory, intended to demonstrate the presence in the blood, during suffocation, of products of incomplete oxidation. He declared, also, that dyspnea is due to products of incomplete oxidation.<sup>40</sup>

But Pflüger soon changed his opinion; he disproved his earlier findings of products of incomplete combustion in the blood, and, in 1872, rejected the old hypothesis,<sup>41</sup> going even so far as to assert that he had recognized and taught the correct theory even before Voit. In extra large type on page 46 of this paper occurs the following very important sentence which expresses the views of physiologists today: "Here lies (in the cell itself alone) the essential secret of the regulation of the oxygen used by the body; it is not determined by the blood pressure, the velocity of the blood stream, the activity of the heart, or the activity of the respiration."<sup>42</sup>

In 1875, both Voit<sup>43</sup> and Pflüger<sup>42</sup> complain that the new view is not everywhere known and accepted; according to Voit, even Liebig still opposed it. But that the results are not everywhere ignored is shown by Voit's further complaint against those who say that they recognized and demonstrated the truth before he (Voit) did; he disputes especially Pflüger's priority claims.

During the years 1875 to 1878 a great many papers on respiration and metabolism appeared from Pflüger's laboratory.<sup>43</sup> Many of them are very long and offer as evidence not only experiments carried out in Pflüger's laboratory, but an enormous amount of other evidence from all departments of biology. His own experiments deal largely with measurements of the amount of metabolism under conditions of varying oxygen supply. The papers are polemic in character and their influence on other physiologists is reflected in the gradual change in the nature of discussion. The earlier papers are devoted to demonstrating that the opponents of the new view are wrong. Pflüger opposed<sup>44</sup> especially the contentions of Ludwig and his pupils<sup>45</sup> that oxidation in the muscles is proportional to the velocity of the blood, and that during suffocation the blood contains products of incomplete oxidation. He seems to have overcome opposition to the new view toward the end of this period, for later papers<sup>46</sup> are directed largely at those—in Hoppe-Seyler's laboratory especially<sup>47</sup>—who dispute his claims for priority. Physiologists commonly give Pflüger credit for first demonstrating the truth regarding oxidation. As a matter of fact, Voit first taught the truth; but Pflüger overcame opposition and convinced the scientific world.

With the opening of his new institute in 1878 Pflüger seems to have concluded his work on respiration and turned his attention to other problems. Judging by a statement from Hoppe-Seyler's laboratory at this time,<sup>47</sup> the new view seems to have gained general acceptance. Lud-

wig alone holding out; Ludwig apparently never accepted the new view.<sup>48</sup> (He died in 1895.)

But since 1878—long enough ago it would seem for the facts to have filtered into clinical medicine—no physiologist has contended that products of incomplete oxidation will result from either poor respiration or poor circulation. It is to be hoped that more active emphasis on the practical aspect of physiology will purge clinical medicine of ideas generally recognized by physiologists as incorrect.

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## Original Articles.

## INSUFFICIENT OXYGEN SUPPLY AS A FACTOR IN DISEASE.

BY FRANCIS H. MCCRUDDEN, S.B., M.D., BOSTON.

*Laboratory Director, Robert B. Brigham Hospital, Boston,**Assistant Professor of Applied Therapeutics, Tufts Medical School, Boston.*

IN the training of physicians more emphasis should be laid on the practical aspects of physiology.<sup>1</sup>

The best evidences that the medical student does not receive adequate instruction in the practical aspects of this important subject are the primitive notions of physiology so frequently exhibited in the explanations of the mechanism of disease and the mode of action of different forms of treatment, given in our clinical journals. The abundance of such evidences sometimes suggests that the steady advance of physiology makes but little impression on practical medicine.

No better example of the failure of a fundamental physiological fact to impress itself on clinical medicine can be cited than the constant recurrence of the myth of "insufficient oxygen supply," for over a century a favorite explanation of pathological symptoms. The belief in "insufficient oxygen supply" is based on an erroneous notion of the nature of metabolism, according to which the amount of oxidation is regulated by the respiration. The metabolic processes are sometimes compared with the blacksmith's fire, the lungs with the bellows; the intensity of the metabolism being attributed to the activity of the respiration.<sup>2</sup>

This notion is widespread. In the daily press it is reflected in the references to the relation between "correct breathing" and the "laws of health." It shows itself in the popular fallacy that in cold weather deep breathing is advisable because "deep breathing stimulates the metabolism and thereby develops heat."

But it is not confined to the laity. "The condition is due to products of insufficient oxygen supply" appears perennially in the clinical journals. Even in recent numbers of our leading clinical journals the dyspnea of heart disease is ascribed to products of incomplete oxidation,<sup>3</sup> and twice recently the notion has received favorable editorial comment in the *Journal of the American Medical Association*.<sup>4</sup> To cite one of the several similar passages in these papers:<sup>5</sup> "In the pure cardiac cases the dyspnea seems to depend on a slow or insufficient circulation, which results in a poor oxygenation of the tissues and may even cause a transient acidosis owing to the incomplete combustion of metabolic products."\*

\* Probably does not claim originality for this notion; he attributes it to Porces, Leimbörger and Markovici,<sup>6</sup> to Beddard and

One of the best known examples of this notion is the belief that gout and the "uric acid diathesis" are due to the accumulation of products—chiefly uric acid—of incomplete oxidation of protein.<sup>11</sup> This belief is one of the errors at the basis of the widely accepted hypotheses of Haig<sup>12</sup> concerning gout and many other diseases.

Liebig declares<sup>13</sup> that when people who suffer from uric acid concretions go to the country, they sometimes get, as a result of better oxygenation, concretions of oxalic acid—an oxidation product of uric acid; and that when they exercise and so absorb still more oxygen, the concretions are completely oxidized to carbon dioxide and water. Animals that drink much water, according to Liebig, excrete less uric acid than others; the water keeps the sparingly soluble uric acid in solution so that it becomes more completely oxidized to urea.

Many investigators have attributed symptoms in leukemia, chlorosis, and emphysema to the products of incomplete oxidation, believing that the symptoms result from decreased external or internal respiration respectively.<sup>13</sup>

The introduction of hypophosphites into medicine was due to the belief that phthisis is due to incomplete oxidation.<sup>14</sup> Phosphorus and its partly oxidized derivatives, the hypophosphites, were recommended in this disease in the belief that they attract oxygen to the tissues.

Nencki and Sieber<sup>15</sup> proposed to measure the oxidizing power of the body under different conditions by determining the amount of benzol that can be oxidized to phenol; and concluded, as a result of such experiments, that in leukemia there is a decreased power of oxidation, in anemia and chlorosis no change.

Examples might be multiplied<sup>16</sup>; but these few will suffice to illustrate the nature of the fallacy.

The source of the error is found in the writings of Lavoisier.

In 1777,<sup>17</sup> Lavoisier cited metabolism experiments which he had carried out on birds, to show that respiration results in a combination of the carbon of the blood with oxygen to form carbon dioxide; he concluded that the process is analogous to that which two years previously he had described as combustion. But in elaborating this theory twelve years later,<sup>18</sup> he laid the foundation of future error. He speaks of incomplete oxidation of digestive products as a possible cause of disease, and urges the use of purgatives to rid the body of such products; he attributes the fevers of hospitals and prisons to the insufficient oxidation resulting from the impure air. In the following year<sup>19</sup> he declared that the metabolism is more active, and more heat, there-

Pembrey,<sup>7</sup> and to Lewis and Ranroft.<sup>8</sup> And he thereby illustrates the manner in which a false notion—like a rumor—spreads, each repetition of the notion, as it becomes further removed from the facts, becoming more incorrect and yet more dogmatic. These authors carefully avoided stating any such hypothesis as Peabody attributes to them; Beddard and Pembrey, in fact, state that the evidence is against such a hypothesis.

The hypothesis was, however, proposed by Pfleger in 1868.<sup>9</sup> Later, however (1872),<sup>10</sup> it was rejected and vigorously combated by him. But Peabody does not refer to this.



striction of carbohydrates and proteins, subsequent to a day or two of fasting, he kept the animals sugar-free indefinitely, though they lost some weight, retaining, however, both strength and activity.

In more severe induced cases, where the fast was prolonged to a week or more, and the diet greatly reduced for the purpose of depressing metabolism, return to increase in weight and metabolism were accompanied by a recurrence of sugar; persistence of sugar tolerance reduced carbohydrate tolerance, and repeated fasting periods increased it. Prevention of glycosuria reduces the weight for a period, and abolishes ketonuria; later, on a similar diet, weight increases without acidosis and without injury to the islands of Langerhans. Absence of urinary sugar ketones and of hyperglycemia increases tolerance for carbohydrates and protects internal secretion of ductless glands, especially of the pancreas and of the pars intermedia of the hypophysis and probably decrease of kidney permeability.

Stillman, in an illuminating paper very recently published, has further analyzed glycosurias with reference to that most dangerous complication, acidosis. Modern treatment has attempted control of acidosis on the discarded theory of von Noorden, that "fats burn in the fuel of carbohydrates." As Stillman has noted, rational treatment of glycosuria has been retarded by the accepted idea, that "over-feeding with fat is harmless, and even beneficial, and that carbohydrate feeding is required to avert threatening coma."

Excess of fat frequently predisposes to acidosis as shown in a case under my care during the present season, whose diet on February 16th consisted of protein, 239 calories; fat, 1388 calories; carbohydrate, 237 calories, with sugar output of 80.5 grams in 24 hours, and urinary ammonia, 1,696, more than five times the normal. On the following day the protein was reduced from 239 to 98 calories; the fat from 1388 to 200 calories, and the carbohydrate from 237 to 142 calories, the greatest relative reduction being in fats. The result on the fifth day of this reduction was a fall of sugar to zero and of ammonia to normal, after which protein and carbohydrate were gradually increased, with fats to about one-half the original quantity, without development of sugar or increase of ammonia above normal.

Stettin's success with cases incipiently surgical, in preventing advanced complications leading towards amputations, was due first, to exact and skillful medical direction, and second to the most painstaking surgical care. It is a duty to call a competent surgeon at the very first sign of infection of any sort, especially of the lower extremities. Joslin notes that diabetics live for years on an atrocious diet, untreated, without developing coma, until they are advised by some inexperienced medico, greatly to increase the fats or decrease carbohydrates, when coma promptly supervenes. Acidosis is not a product

of carbohydrates, but develops from fats and protein, sudden change of which above or below the customary amount, often in these long standing cases, acts like poison. Patients tending toward acidosis should at first be deprived of fats, and its introduction to the diet be made very gradually. Since, though a valuable food, it cannot be metabolized until the system becomes adjusted to its use. Prior to fasting, in such cases, Joslin wisely advised the *not common* plan of eliminating fat for some days from the dietary; then cutting out proteins, a factor of somewhat lesser moment for development of acidosis, but quite important enough. Reduce now quickly carbohydrates, halving each day, for three days, and proceed to hunger days with graduated return to prescribed diet. Infectious cases, while fasting, should not be deprived of sodium chloride and should have abundant water, and if there be a tendency toward coma and vomiting, normal saline solution, per colon, should be constantly introduced by the Murphy method or by hypodermolysis of salt solution. Small rather than large amounts of sodium bicarbonate are most efficient, half an ounce or less in 24 hours being usually sufficient; frequently *none* is required in the treatment of acidosis. Intravenous injection has been discarded.

Control of sugar, important as it is, becomes subordinate to the *control of acidosis*, which is associated with decreased blood alkalinity to the point of subnormal. Accumulation of hemic acids, as pointed out by Stillman, neutralizes a portion of the normal sodium bicarbonate of the blood and, when advanced in an exaggerated degree, produces death. *Reduced excretion of acids, or excessive production* is equally destructive of tolerance. Fruits, as noted by many physiologists, notably Bunge and by Sherman, increase hemic alkalinity by the introduction of easily assailable alkaline bases.

Acidosis may be determined by urinalysis when excretion is not impaired, but increased production requires more elaborate tests. For determining over-production, for faulty elimination due to decreased kidney permeability, the direct method of Van Slyke, from the blood admits of estimation of acid retention, as compared with urinary excretion, and adds valuable data for prognosis and treatment, as also does the use of Haldane's apparatus, both, however, requiring considerable training for exactness.

Stillman divides fasting glycosurias as regards acidosis, into four groups, and shows that the same individual may react at different fasting periods, in an entirely different manner.

Group 1 represents cases with normal hemic bicarbonate retention (euglycemia), no acidosis, these being a good percentage of all cases.

2. Cases which under fast, or recover from acid intoxication, even showed at the verge of coma, which are less frequent to observe.

3. Those cases showing only a moderately



by persistently diminished bicarbonate reserve in the blood, and increased ammonia secretion.

4. Such rare cases as develop acidosis while fasting, though previously free.

Sydenham and Rollo many years ago demonstrated that diabetics are made sugar-free by an exclusively flesh diet, and, until Mosse determined that a wholly meat and fat diet induced coma, such continued to be the approved treatment. Bouchard, studying auto-intoxication, showed that the feces of meat-fed animals were intensely toxic, as compared with vegetable eaters; as also did Herter. The bacteria of meat are putrefactive in type; proteolytic organisms, producing ptomaines and toxæmia. Putrefactive changes in the colon, of the residue of flesh, tend to irritation of the colon mucosa or to ulceration, and to *non-resistance* of the colon membrane to the absorption of toxins.

Falta states that "much meat is injurious to diabetics," animal protein having a higher percentage of *purin bodies* than vegetable protein, and this observation is confirmed by Allen. Falta says that some glycosuria patients are more sensitive to protein than to carbohydrates.

Graham Lusk, in a paper read before the New York Academy of Medicine within the month, gives as his opinion, as the result of observation and experimental work, that 4 or 5 grams of nitrogen, *i.e.*, 25 to 30 grams of protein in 24 hours, is sufficient for body needs in health, for the average weight adult and *practically all* that will be appropriated.

Von Noorden recognizes that a period of restricted diet, such as green vegetable days, raises the tolerance for carbohydrates "provided no meat be given with them."

Klemperer, in cases of acidosis, advises vegetable days, followed by carbohydrates, with butter and eggs "but no meat whatever." He says "meat spoils the results; even eggs may do so; vegetable albumen is well borne." The albumen of eggs in a small proportion of subjects, in any condition of health, produces a condition simulating anaphylaxis.

Naunyn finds the benefits of "hunger days," or vegetable days, are dependent upon the exclusion of meat, and says "the general benefit attaching to all 'grain cures' is the exclusion of . . . harmful foods such as meat."

In Allen's judgment much of the benefit of the *oat diet* is due to the complete withdrawal of meat, in which conclusion Chittenden, Combe, Folin, Fisher and many others agree.

Physiologists demonstrate that the function of protein is to replace wear of living tissues; that of carbohydrates, by their combustion, to maintain heat and muscular activity. As Kellogg aptly says, "Carbohydrate is the coal, while protein is the metal repair for the machinery."

I have, however, observed a patient for four months, who had been meat-free for two years, with unusually increased tolerance for carbohydrates, and reduction of sugar output to zero, who experiment-

ally ate for one month, along with vegetable protein, 250 calories daily of chicken and bacon, without return of glycosuria or acidosis, although the case had been one of a most obstinate character. In this exceptional instance, appetite was lost for exclusively vegetable foods, and regained only by the addition of a modest amount of flesh diet. This case illustrates well, effects of nervous strain upon the delicately poised glycosuria, as a week in New York, required by illness in her family, and consequent emotional stress, without change of diet—returned with sugar, from a daily output of zero, when patient left the institution, to 46½ grams; ammonia increased from normal to great excess; on return, under normal mental conditions, in three days sugar was down to 6 grams, ammonia normal. One must recognize, that in this case mentioned, tolerance had been established and health restored by low fats and moderate proteins, by regular "hunger days" followed on each occasion by two "green days" and slow return to moderate carbohydrate content. The sound maxim of Virgil, "*in medio tutissimus ibis*," requires much caution and judgment in application to determine what is the middle course in which you will go safest, since that which is the middle course at one stage of any case, may be an extreme course at another. As in all other treatment of disease, hard and fast rules fail in diabetes, since one must in reason consider, not only the chemistry of the patient, but also the human element of psychological coöperation and physical appetite.

Benedict and Joslin have independently proved that the most advanced cases of diabetes retain some degree of power to burn carbohydrates. Joslin had no death in a mixed group of diabetics in 350 days, under more or less prolonged intermittent fasting treatment, and has found among 912 cases, in which the immediate causes of death have been varied, 64% were associated with coma; he states that coma can nearly always be foreseen and prevented by watching for acidosis, since the basic disease, diabetes, is chronic in character, and offers ample warnings to that medical attendant, who is observant and wary. Ether anesthesia would wisely be avoided; especially is the danger of coma increased in persons past fifty years of age, on account of impairment of kidney elimination; *general or acute local infections* often add the final factor, precipitating coma. Speaking of infections of the legs, such as slowly advancing gangrene, Joslin deprecates delay in active treatment and says: "handicapped by a lingering infection, which only too often is allowed to continue for months, with kidneys less efficient for throwing off the acidosis attack; deprived of exercise—that recently proven stimulus to sugar consumption—these pitiful cases frequently meet a fourth enemy in ether anesthesia; and is it any wonder that a formerly innocent disease becomes virulent, and the victim dies of coma?"

Attention has recently been called, in persons developing coma, to a new sign, *i.e.*, the rapid decrease of intraocular tension, this lowered eye



John Arbuthnot, M.D., of Aberdeen, was the companion of Pope, Gay, Swift and Parnell and reflected honor on our profession. In 1704, he published "An Argument for Divine Providence Drawn from the Equal Number of Births of Both Sexes," which procured his admission to the Royal Society. How shocked he would be today if he could know that there were in Germany over 780,000 surplus women, and in Austria 600,000, before the outbreak of the present war, and that a similar inequality exists in other nations. It is fortunate that the existence of Divine Providence does not depend upon an argument based upon such premises.

Dr. John Hall, of Shakespeare's time, is a name which stimulates our imagination and curiosity. He was respected in Stratford, where he lived, and married Shakespeare's daughter, Susanna. Did Shakespeare discuss with his son-in-law the various medical matters in his own plays which have excited so much comment in later days? It is a disappointment to find that Black, in his story of Judith Shakespeare, has so little to say about her medical brother-in-law.

Dr. John Brown of Edinburgh lived within the remembrance of some of us, and all of us know his "Rab and his Friends"—a story of appreciation of an animal friend, but also a description of the medical students of Edinburgh of his day. It was of them that he made the distinction between pity as an emotion and pity as a motive. In his somewhat boisterous students, pity as an emotion leading to tears and useless exclamations was dead, but as a motive inciting to help, it was alive and active.

America has been fruitful in medical scholars. Time fails us to speak of Rush and Jacob Bigelow and his son Henry, of Bowditch and Jackson, and the host whose names crowd upon us. We think of Holmes and Weir Mitchell, both of whom contributed alike to medical and general literature. One may feel that a medical education furnishes an admirable foundation for a literary career.

A monograph by Dr. Henry I. Bowditch on Diaphragmatic Hernia, deserves especial mention, as it illustrates scholarly work at the bedside, in the autopsy room, the library and the study. It was he who gave some of the oldest of us our first lessons in the use of the stethoscope. Going about the wards of the Massachusetts General Hospital with a class of students to study healthy lung and heart sounds he came upon a young man with an injury, probably a fracture of the spine. Listening for the heart sounds, he found the heart dislocated to the right and only the sounds of intestinal gurgles in the left chest. He made the diagnosis of rupture of the diaphragm. When the patient died, a few days later, an autopsy was refused. Dr. Bowditch entered the autopsy room late at night and by the light of the moon made an examination which disclosed not a

rupture, but almost complete congenital absence of the left side of the diaphragm. Of this case, he wrote for his Harvard Class Book:

"The case interested me very deeply, and I looked in books and journals, American and foreign, for others similar. Between 1610 and 1846, I could find only eighty-eight cases. These I tabulated according to the 'Numerical Method' of my dear master Louis, and tried to extract from them all the truths they contained, anatomical, symptomatic, and causes; with diagnosis and prognosis as to the duration of life and treatment. I had a most delightful work, away from all the cares of common and professional life. I knew I was doing what had not been done before, and I knew that I must necessarily make a compact expression of the truth on the subject which would be worthy of respect and useful to any physician who should meet such a case. In my preface to the pamphlet (p. 77) that I printed from the *Journal*, I closed with these words, 'I hope that the memoir will be useful to the future student of Diaphragmatic Hernia, but the examination of it can never afford anyone a tithe of the pleasure or profit the original preparation of it afforded me.'"

As one of the foremost of American scholars must be mentioned John Billings. Graduated from a small medical college in the West, he served with distinction as a military surgeon during the Civil War and at its close was attached to Medical Headquarters at Washington. There, he was instrumental in building up the Library of the Surgeon General's Office until it ranks with the great libraries of Paris and London. He was the inspirer and first editor of the *Index Catalogue*, which is, practically, a catalogue of all medical books and an index to all medical journals, and, after retiring from the army by reason of years, he became the librarian of the New York Library. All medical scholars who have occasion to learn what their predecessors have done are indebted to the scholarship and industry of Dr. Billings. And I am sure we may incoincidentally find friend and successor, Dr. Robert Fletcher and the Librarian of our Boston Medical Library, Dr. James R. Chadwick, for our M.D. and Librarian has greatly encouraged scholarship.

It was scholarly work too, the collection of the scattered records of our Civil War, and the combining them in those volumes, the *Records of the War*, which form a part of the *Records of the Nation*. One can read later of their use in the preparation of our medical history, and how the records were capable of more than one use, and may there learn to appreciate the value of the thing of which they were made. It is a tribute to our present generation that we have preserved the records of our Civil War, and some extent of our medical history.

It is a tribute to our present generation



lowed these scholars of the past. The names that have survived the longest are those of the men who have studied most closely the human body, which I have already designated as the medical student's most precious volume. Our anatomical and clinical vocabularies have perpetuated the names of these scholars more carefully than any hall of fame. It is the recorders of facts rather than opinions who have lived. The more we learn of these learned physicians dead and gone, the greater our reverence. They had their jealousies, their human frailties, but they were leaders of thought and they sought the good of the human race. Their names may perish, their books may become obsolete, but no man works as a true scholar, seeking knowledge for its own sake, and sharing it with his friends and his students, without leaving the world a little better for his labors. Their unrecognized influence lives about us still.

There is work for the present-day scholar. It must be a medical scholar who will deduce the lessons to be gathered from the fearful carnage of the present European war, even as the scholars of our Civil War gathered the lessons of those fateful years, so that all the wounds and human waste of this time of frightfulness shall not be entirely in vain.

Even the present athletic furor is not without its lessons for the medical scholar who tabulates the heart strain and measures and records the body waste. Never was a wider field open to the medical student.

One duty of the medical scholar of today will be to present to the intelligent public an honest view of life and disease, that the strange doctrines which flourish among us may cease to attract otherwise intelligent individuals.

Possibly scholars themselves need caution lest in rebuking the errors of others, the "pseudodoxia epidemica" of the present day, they themselves shall merit the criticism of some individual who may speak to the John Harvard scholars of some future year.

In giving these John Harvard scholarships, the University grants no empty honor, for they carry with them not only their high academic distinction, but also a responsibility. There devolves upon these John Harvard scholars the duty that, so far as in them lies, they shall maintain for their chosen profession its rank as a scholarly and beneficent profession—a profession whose object is not alone the diminution of suffering, but the increase of knowledge and the improvement of the human race.

## Therapeutic and Preventive Medicine.

### TREATMENT OF DIABETES.\*

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It has been accepted by the profession, until very recent years, that the treatment of diabetes was satisfactory which reduced the sugar output to a moderate percentage, prevented much acidosis, neuritis, subjective symptoms and escaped coma. Only of late has any physician suspected an ideal treatment with the highest result, as distantly possible. That extraordinary benefits to the organism could come from continued absence of urinary sugar, or that the hope might be entertained of practically continuous aglycosuric conditions, with possible absolute cure, was scarcely conceivable.

Once, however, the idea is established, that nearly every patient can be made sugar-free and kept so, while following a definite plan of diet, the interest and enthusiasm of both doctor and patient, and the self-education and coöperation of patient are inevitable.

Guelpa read a notable paper before the British Medical Association in July, 1910, entitled "Starvation and Purgation in the Relief of Disease," recently reviewed by Kellogg. This article maintained that diabetes mellitus is due to auto-intoxication from intestinal putrefaction, which has never been proven, reporting many cases made sugar-free in short periods of time by frequent starvations; usually accomplishing this in two or three days, and demonstrating that repeated fasting periods caused in some instances permanent aglycosuria.

Bardet later stated, before the Société de Médecine, that Guelpa's discovery had "completely upset established ideas" as to diabetes. Guelpa also reduced carbohydrates and proteins and eliminated the dread of acidosis and coma for fasting diabetics. He changed intestinal flora (which has been proved), reduced arterial tension, relieved neuritis, and improved the general health.

Fasting, which in normal man produces acidosis, has no such influence in the glycosuric, excepting in very rare instances, as lately pointed out by Stillman. In the "green diet," von Noorden and Naunyn had earlier recognized the same principle, but had not emphasized the idea or employed it successfully. Allen has scientifically demonstrated it by animal and human experimentation. In 1914 he reported results in depancreatized animals, the duets remaining *in situ*, along with the small portion of retained pancreas, producing at will, by diet, all stages of diabetes. In his produced mild cases, by re-

\* Read before the American Climatological and Clinical Association, Washington, D. C., May 10, 1916. Congress American Physicians and Surgeons.



the prominent symptoms of the exudative diathesis, namely asthma, then we may find a condition closely related to the so-called thymic asthma just brought to your attention. Second is the prominent group with eczema predominating, and third the group with asthma. It may not be necessary that the connecting link between these be a demonstrable pathological lesion of the lymphatic tissue. There may be a biochemical relation. Pfaundler stated several years ago that the diet had a marked effect on causing these conditions, while digestive disturbances are common. To quote him, "Is it not possible that under certain conditions (an unfavorable predisposition as to the function of intestinal and cellular digestion) foodstuffs digested into the gastro-intestinal tract might act in the body like an antigen; if this should be the case, then it would be quite natural to assume that the lymphatic diathesis represents a kind of food allergy (food anaphylaxis)."

Schloss in 1912 showed that egg poisoning in children is a form of anaphylaxis. It is well known that eczema is made worse by excess of fats and carbohydrates, but some recent work goes to show that proteids often are an exciting cause. To come directly now to the question of child asthma, it has just been shown that certain proteids may bring on in a child so predisposed typical attacks of bronchial asthma. It seems to me that this subject of proteid anaphylaxis or sensitiveness to proteids is being widely opened up, and that we are at a point of view of great importance. Whether there is any relation between lymphatism and proteid anaphylaxis is a very open question. Talbot has studied infants in relation to proteid anaphylaxis to asthma. The sensitization apparently takes place either by the unchanged proteid passing directly into the blood through the intestinal mucous membrane in the earliest weeks of life, or through the injured intestinal mucous membrane in later infancy during some digestive upset as diarrhoea. There may be also an inherited sensitiveness. The infants are tested by scarifying the skin and rubbing in the suspected proteid. Several foods may be tested at once on as many scarifications. Egg white, various kinds of meats, beef juice, milk for the casein, various grains such as barley and oat meal for the gluten, etc., are used. Within 15 minutes a small wheal or an erythema arises where the causative proteid was inoculated. Talbot has found that various proteids are the factors in many cases of child asthma, egg being the commonest cause. After the egg is found to be a cause, the asthma ceases on withdrawing the egg from the diet. This, of course, is a most inconvenient procedure, so he has attempted to accustom the child to egg by starting with one milligram doses of egg albumen in capsule by mouth, with increasing amounts, and he has met with success which is, however, if not complete, encouraging.

My personal experience is rather limited. One

child with an idiosyncrasy to egg, manifested by urticaria and eczema, had a typical attack of bronchial asthma. Attempts to immunize her brought on oedema with the third milligram dose of egg albumen. Another older boy had partial relief from his asthma when beef, to which he reacted, was withdrawn from his diet. The most striking case was a child of a year of age. At nine months she had had a good deal of mucus in her movements so at this time she may have become sensitized. About every three weeks she would have an unaccountable attack of mucous colitis and either asthmatic bronchitis or asthma. It took several attacks before we realized the attacks were true asthma and not primarily recurrent infections of the bronchial mucous membranes. Attempts at regulation of the diet were unavailing, for apparently what agreed with her at one time did not at another. Finally, by testing the skin with all foods she was taking that contained proteid, it was found that her troubles were due to beef juice. After withdrawal of this she had practically no more asthma, although she had a few more attacks of mucous colitis due to an apparent sensitiveness to milk proteid. But after her diet became more varied she showed marked improvement in this condition also. Here it seemed that it took the accumulation of two or three weeks of daily portions of beef juice before sufficient poison was at hand to bring on an attack, a condition somewhat different from the egg cases where perhaps one morsel of food containing egg may bring on asthma.

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## GUILLAUME DE PUYTREN, 1817-1890

By WILLIAM FRANK COLE, M.D., B.S.

It has been said that "the greatest physician in America" was a Frenchman, and of some subject he was especially interested in that he could not go far in his studies without coming to him. That subject was medicine, and he, a German, I would say, was a Frenchman.



what as regards surgery at least, and say that if there was any modern surgeon especially interested in certain pet theories and principles, seemingly of modern times, that if he would but look back he would find that much of the work had been done by a Frenchman nearly a hundred years ago, and that Frenchman was Guillaume Dupuytren.

In the present age of telephones, motor cars, and dictagraphs, not to speak of the many instruments of precision at the service of medical men, to make their work easier and more exact, it is wise to look back and see what was accomplished by the great men of the early part of the last century, without these aids to our science.

Among the names of the many great French surgeons of the last century, that of Dupuytren stands first. In France the mutterings and rumblings of the great storm that was soon to break in the form of the Revolution, were growing louder and more insistent at the time of the birth of Dupuytren in 1777. Is it a coincidence that so many of the great medical men of France, hardly any of them from the aristocracy, were born at about this time? Malgaigne, Velpeau, Roux, Larrey, Dupuytren,—what names for a nation to be proud of and cherish! A study of the lives of such men as these leaves no room for doubt as to the cause of the wonderful powers of France, in her hour of need in the present great European struggle.

Guillaume Dupuytren was born at Pierre-Bouffiere, a town of Haute-Vienne, on October 5, 1777. (Some authorities give October 5, 1778.) His father was an advocate of very limited means, and though some accounts tell us of medical forbears, nothing definite is stated concerning this question. History tells us that, as a boy, Dupuytren was of more than ordinary attractive appearance and charm, and it is pretty definite that on account of this unusual personal attraction, he was kidnapped, when of tender age, by a rich lady of Toulouse; he was, however, returned to his family in a short time. In 1789, a cavalry officer who was stationed at Pierre-Bouffiere took a great fancy to the boy and it did not take a great amount of urging to obtain the permission of the elder Dupuytren to allow the boy to accompany him to Paris. On arrival at Paris, he was sent to the College of La Marche, which was directed by Monsieur Coësson, a brother of the officer. It was said that the young student particularly distinguished himself in philosophy while there, but from the evidence at our disposal, it seems that he was not in the least the "goody" type of boy, and got into all the scrapes and troubles that a normal boy should.

At about the time that the Revolution came to an end, Dupuytren was old enough to think of his definite career in life, and unhesitatingly chose the profession of medicine. He was hardly eighteen years old when he was chosen prosec-

tor at the École de Médecine, and in 1801 he was promoted to the position of "Chef de Travaux Anatomiques." We know that about this time he also paid great attention to the study of physiology and pathology, and this, as will be seen later, was of lasting value to him in his later work. In 1804, Dupuytren obtained one of the positions he had been striving for, and was appointed surgeon of the second class at the Hotel Dieu, where almost all of his work was done.

Malgaigne tells us some interesting anecdotes of the early days of Dupuytren in Paris, and apparently it was against his parents' wish that he stayed there. We know that his requests for money to keep on with his work were not granted by his parents. In his early struggles, which were almost unbelievably hard, like Velpeau's and Malgaigne's, he received a call one day from that great philosopher, Saint-Simon, who had become interested in the boy, probably on account of his bent for philosophy. He found Dupuytren working in bed on account of the cold, and other signs of abject poverty could not fail to be read. After a brief visit, Saint-Simon departed leaving a roll of bills amounting to two hundred francs on the barren mantel. Dupuytren soon saw the money, dressed quickly, and was soon at the house of Saint-Simon with it. He found the great man at home and said, "Here is something you forgot at my house." Saint-Simon could not tell the poor student the truth, and so after a moment said, "Yes, I forgot them."

The years that followed were indeed hard ones, probably no present day physician can form any conception of them. Much of the latter day bitterness and reserve of the great surgeon was undoubtedly on account of the indelible impress of the terrible times through which he passed in his youth. At one time, during his early life in Paris, his funds got so low that he had to subsist on bread and cheese for six weeks, but his determination to surmount all obstacles made him suffer all and endure all with fixed determination. It was at this time that he used the fat of the subjects in the dissecting room to make oil, with which to light his poor lamp. It might be said that fat, a substance abhorred by all dissectors, was never used to better purpose.

Stories conflict as to the exact facts regarding Dupuytren's first appointment at the Hotel Dieu, but there is no question as to the exceedingly bitter struggle for the place between Dupuytren and Roux. One story is that there was a *concours* for the place of third surgeon, a position that had never been existent until this time, and it was supposed by some that this was created expressly for Dupuytren, whose great operative skill was just beginning to be recognized. Roux determined to contest the position, and his examination proved to be equally good with that of Dupuytren. The de-



**CASE 3.** This case is reported for what it is worth; the striking result being sufficient justification. The patient was a boy aged three days. Born after normal labor, he had a violent convulsion when only a few minutes old, and these continued at the rate of five or six daily. Prominence of the upper portion of the chest suggested the possibility of enlarged thymus as the causative agent. The child was brought for examination at 7.30 p.m., having had a convulsion at 5. It was very weak and ap-

subject was purposely omitted. It should be begun lightly and increased if results do not follow. The writer's average has been from two to three minutes with a hard ray, filtered thru aluminum.

The writer's thanks are due to Dr. Maynard Ladd of Boston, Drs. G. M. Allen, M. Lincoln and A. W. Marsh of Worcester for the privilege of reporting the cases here cited.



CASE II.—Dr. Maynard Ladd.

peared to be nearly in extremis. Roentgenogram, rather hastily taken on account of the child's condition, showed a suspicious shadow in the upper mediastinal region. A treatment as vigorous as seemed safe was at once given. The child rested well that night; at 5 a.m. the next day had a little twitching of the eyelids but no convulsions. Began to nurse normally. Three treatments were given at three-day intervals. No more convulsions occurred and the child at once began to develop in normal way, which improvement has continued to the present,—6 weeks after the last treatment.

Dosage varies so much that discussion of it

is not warranted. The treatment was given by the writer, who has had no previous experience with it. The first treatment was given at 7.30 p.m. on the day of admission. The second treatment was given at 7.30 p.m. on the third day. The third treatment was given at 7.30 p.m. on the sixth day. The fourth treatment was given at 7.30 p.m. on the ninth day. The fifth treatment was given at 7.30 p.m. on the twelfth day. The sixth treatment was given at 7.30 p.m. on the fifteenth day. The seventh treatment was given at 7.30 p.m. on the eighteenth day. The eighth treatment was given at 7.30 p.m. on the twenty-first day. The ninth treatment was given at 7.30 p.m. on the twenty-fourth day. The tenth treatment was given at 7.30 p.m. on the twenty-seventh day. The eleventh treatment was given at 7.30 p.m. on the thirtieth day. The twelfth treatment was given at 7.30 p.m. on the thirty-third day. The thirteenth treatment was given at 7.30 p.m. on the thirty-sixth day. The fourteenth treatment was given at 7.30 p.m. on the thirty-ninth day. The fifteenth treatment was given at 7.30 p.m. on the forty-second day. The sixteenth treatment was given at 7.30 p.m. on the forty-fifth day. The seventeenth treatment was given at 7.30 p.m. on the forty-eighth day. The eighteenth treatment was given at 7.30 p.m. on the fifty-first day. The nineteenth treatment was given at 7.30 p.m. on the fifty-fourth day. The twentieth treatment was given at 7.30 p.m. on the fifty-seventh day. The twenty-first treatment was given at 7.30 p.m. on the sixtieth day. The twenty-second treatment was given at 7.30 p.m. on the sixty-third day. The twenty-third treatment was given at 7.30 p.m. on the sixty-sixth day. The twenty-fourth treatment was given at 7.30 p.m. on the sixty-ninth day. The twenty-fifth treatment was given at 7.30 p.m. on the seventy-second day. The twenty-sixth treatment was given at 7.30 p.m. on the seventy-fifth day. The twenty-seventh treatment was given at 7.30 p.m. on the seventy-eighth day. The twenty-eighth treatment was given at 7.30 p.m. on the eighty-first day. The twenty-ninth treatment was given at 7.30 p.m. on the eighty-fourth day. The thirtieth treatment was given at 7.30 p.m. on the eighty-seventh day. The thirty-first treatment was given at 7.30 p.m. on the ninetyth day. The thirty-second treatment was given at 7.30 p.m. on the ninety-third day. The thirty-third treatment was given at 7.30 p.m. on the ninety-sixth day. The thirty-fourth treatment was given at 7.30 p.m. on the ninety-ninth day. The thirty-fifth treatment was given at 7.30 p.m. on the one hundredth day.



find the general condition behind it if we are to get anywhere. In looking around, one of the general conditions which we run across is the so-called lymphatic constitution and this is what I first want to discuss in its relation to asthma.

Three states of childhood are spoken of together, namely, the lymphatic constitution, neuro-arthritis and exudative diathesis. Whether they are entirely different conditions or different manifestations depending on the pre-

and a sensitiveness of the respiratory mucous membranes. Many other symptoms are often present, such as an intermittent fever, chills, perspiration, adenoids and swelling of the tonsils and glands of the throat, jaw and neck, anemia, pseudo-hypertrophy of the heart with palpitation or arrhythmic pulse; a tender skin, urticaria, intertrigo, crusts on the face and scalp, eczema; coryza, hay fever, laryngitis, diffuse tracheo-bronchitis, bronchiolitis and bronchial



CASE II. After treatment. Showing diminution in thymus shadow.

dominating symptoms of the same condition is not clear, but probably if the latter is not true then at least they stand in close relation to each other. We differentiate the pastous or lymphatic system and a stupid temperament; the erythric or neuro-arthritis habitus, restless and irritable with tender skin, and rather precocious intelligence, and the plethoric obese habitus, babies of tremendous adipose tissue. The general signs and symptoms are a hyperplasia of the lymphatic system, a sensitiveness of the skin,

asthma; a coated tongue, geographical tongue, habitual constipation with muco-membranous enteritis and cyclic vomiting. This is only a partial list of the symptoms and as these symptoms go with other conditions, it shows the complications and uncertainty of their relations.

On one extreme we have the predominating lymphatic type, and it is probable that so-called lymphatism or status thymico-lymphaticus with hypertrophied lymphoid tissue, enlarged spleen and thymus, with tendency to sudden death is the same condition. If to this we add one of



Bulging of the upper part of the chest has also been observed.

Sylvester,<sup>15</sup> of Boston, makes a distinction between the symptoms of cyanosis, stridor, and slow, labored breathing, and those of breathing of the asthmatic type, characterized by fairly easy inspiration and long, difficult expiration accompanied by râles. The first syndrome he ascribes to pressure, the latter to hypersecretion of the thymus.

In differential diagnosis, incoordination of the vocal cords, malformation of the larynx, and when occurring some time after birth, enlarged bronchial glands, adenoids, and swallowed foreign bodies must be ruled out.

The diagnosis is usually best made from a good Roentgenogram, when the enlarged gland appears as a broadening of the upper mediastinal shadow to right or left, or both. An enlargement to the right may be due to other causes, but with broadening to the left, the diagnosis is reasonably certain.

Too much dependence, however, must not be placed on the x-ray. The "critical space of Graetz," as that writer named the superior opening of the thorax, is in young infants less than 2 cm. in diameter, and a very slight antero-posterior enlargement of the gland in this region is sufficient to produce pressure on the trachea, esophagus, and all other structures which pass this point. Diagnosis in such cases, accordingly, must rest on the clinical symptoms.

The first method of treatment proposed was, naturally, surgical removal. The work of Rehn has already been mentioned. Later, resection of the manubrium was tried, and finally thymectomy. Andrews,<sup>16</sup> writing in 1913, claimed that simple ablation of the gland could be done without much risk. Parker's<sup>17</sup> report of 50 cases, however, published about the same time, showed a mortality of 33.1-3%. It is interesting to note the change of heart shown by Veau,<sup>18</sup> a French surgeon, who was a pioneer in the work and to whom were credited 11 of Parker's 50 cases. In 1912 he reported to the Paris *Pédiatrie* Society two cases of his own treated by the Roentgen method, and stated, "for over a year I have not done a thymectomy, and have not yet been disappointed in radiotherapy." It will presently be shown that the latter method obviates even the slight risk claimed by Andrews, and from a practical standpoint it must be admitted that consent to a non-surgical method is much more easily secured than for surgery on patients of such tender age.

The high percentage of mortality from surgical intervention, together with the known success of the Roentgen ray in destroying other structures of a lymphatic nature, induced a trial of this agent. The first case reported was that of Friedlander and Crane,<sup>19</sup> at Cincinnati in 1904. In 1907 Rudberg,<sup>20</sup> by experiments on animals, showed that it was possible to induce all grades of shrinking in the gland, up to the point

of complete fibrosis and destruction of all gland tissue, by action of the ray. Sidney Lange,<sup>21</sup> of Cincinnati, working independently at about the same time, confirmed these results, showed that it was possible to vary the rate of the atrophy by varying the intervals and intensity of the irradiation, and in 1910 he reported to the American Roentgen Ray Society a series of five cases successfully treated. Further confirmation was given the method by the report of Ribl-dean's<sup>22</sup> case, in which, after intensive irradiation had caused the disappearance of the dyspneic symptoms within a few days. The child died later of measles; the autopsy showed fibrous atrophy of the thymus gland. Lange's last report, presented before the Roentgen Ray Society in 1913,<sup>23</sup> included 30 cases from his own and other clinics, in every one of which the application of the ray was followed by prompt and complete recovery. Among later case reports may be mentioned those of Sylvester<sup>15</sup> and of Morgan and Daehler.<sup>24</sup>

The contrast of these excellent records with the one-third mortality of thymectomy would seem to be sufficient argument for Roentgenotherapy, but there is still further evidence to be cited. The objections raised by the advocates of surgical treatment are, first, that the slow action of the ray renders it unsuited for urgent cases, and second, that the gland tends to regenerate rapidly after involution produced by the ray. Rudberg, however, in his experiments already cited, found involution beginning 3½ hours after the first exposure. Lange, in at least one urgent case, was able to bring about a symptomatic cure by one massive treatment. His patient was in such condition that tracheotomy had been done prior to its admission into the hospital. He does not claim that the thymus under these circumstances has undergone complete involution, but simply that its size and function have been decreased sufficiently to tide the patient over a dangerous period. In the milder cases one massive application has produced a symptomatic cure.

The second objection, that of tendency to regeneration, can with justice be brought against surgical treatment as well. The serious results of complete thymectomy in animals have been chronicled. Parker, the advocate of surgical treatment already mentioned, gives as his opinion that the removal of small bits of the gland directly concerned in the production of pressure is as effective as that of larger portions. He believes further that complete thymectomy is practically impossible in the human being. From one of his own cases he quotes the following: "I followed a fairly cooperative case of the case of Kase and Vogt's report, in which the thymus gland was completely removed, and the child died of pneumonia. The autopsy showed that the thymus gland had regenerated to its normal size and function, and that the pneumonia was due to the regrowth of the gland." This is a strong argument in favor of the Roentgen method, which does not destroy the gland completely, but merely reduces it to a size and function which will not produce pressure.



spect to regeneration, but if this occurs after Roentgentherapy it can readily be controlled by repetition of the treatment.

The possibilities of this method of treatment will doubtless be found to increase as our experience with it grows. It is believed by many that there is a connection between enlargement of the thymus, adenoids, and hypertrophied tonsils, and the thymus condition may well be as common as the other two. The irradiation of all suspicious cases might save them from death under an anesthetic or intercurrent infection occurring before the third year, at which time spontaneous relief usually occurs. Even the acute symptoms may not be manifest in every case. The thymus is always a potential source of danger and possible cause of death.

The interrelation of enlarged thymus and hyperthyroidism is now pretty generally recognized. Autopsies on cases of Graves' disease show enlarged thymus in 75%, and in the cases dying after operation the proportion was found at Munich to be even higher. The exact rôle played by the thymus, whether a casual factor or a direct cause of death remains to be worked out. Hector McKenzie, quoted by Parker, found the thymus enlarged in all his cases of Graves' disease that came to autopsy, and suggests that possibly every case in which there is a thymus persisting into adult life is one of potential or latent Graves' disease. For some years the Mayo clinic, among others, has used preoperative irradiation on their cases of exophthalmic goitre, and it may well be that the beneficial effects have been due to the action of the rays on the thymus instead of the thyroid. As an example of thymus hypertrophy in adult life, Lange quotes the case of a woman of 35, suffering for one year with palpitation and choking sensations, increasing so that swallowing and breathing became difficult. X-ray examination disclosed what was believed to be an enlarged thymus. One massive treatment gave relief, after which improvement was progressive.

The excellent article of Lange has already been liberally drawn upon in the preparation of this paper. His deductions, however, are so well-phrased that I shall venture to quote them in conclusion:

1. Roentgen irradiation of the thymus produces artificial involution of the gland.
2. X-ray therapy is the method of choice in cases of enlarged thymus in children, whether the symptoms be mild or urgent.
3. Urgent cases should receive repeated massive doses.
4. Recurrences due to regeneration of the gland are to be watched for and controlled by further treatment.
5. Children whose physical or mental development is retarded should, if suspicion is directed toward the thymus, receive tentative x-ray

treatment, even though a positive diagnosis cannot be established.

6. X-ray therapy as a precautionary measure, or preoperative treatment may enable children of the so-called lymphatic type to withstand intercurrent disease or anesthetics, which would otherwise prove fatal.

7. Pre-operative exposure of older children and adults, where there is a suspicion of enlarged thymus, might lessen operative mortality.

8. Routine pre-operative x-ray treatment in cases of hyperthyroidism should be resorted to with a view to lessening operative mortality.

9. X-ray exposure of the thymus gland has been proven harmless, whether in normal or abnormal individuals. A therapeutic test with the x-ray is, therefore, always permissible.

#### REPORT OF PERSONAL CASES.

CASE 1. Boy aged ten weeks. Born after normal labor. When ten days old had sudden attack of dyspnea and collapse, which recurred frequently at intervals of a few days, and rendered the constant presence of two nurses necessary. X-ray examination was inconclusive, but on the basis of clinical symptoms Roentgentherapy was decided on. Five treatments were given at five-day intervals. After the first exposure the suffocative attacks ceased and the child began to develop normally. At the age of eight months adenoids were removed under light anesthesia, with complete success.

CASE 2. Boy aged 20 months. Weight at birth, 7¼ lbs. at 1 year 24½ lbs. The nurse who attended his mother at birth states that for the first few days the child was constantly troubled with accumulation of mucus in the throat, requiring much attention. Thereafter he developed rapidly and had no sickness during first year. During the fall of 1914 he began to catch cold easily and often. This was noticeable as he had been so free from colds during his first year. He developed a spasmodic cough, so that whooping cough was at first suspected. This cough and a wheezy asthmatic breathing continued throughout the winter. At times it seemed to be controlled by full doses of belladonna. In January, 1915, adenoids were removed, without marked benefit. He was then sent to Atlantic City to see if the change of air would help him. It did not. Dr. Hollinghead, of Philadelphia, then suggested a Roentgenogram.

X-ray examination by Dr. W. S. Newcomet of Philadelphia revealed enlarged thymus, also marked enlargement of right pulmonary hilus shadow. Von Pirquet test positive. X-ray treatment was ineffective until the dosage was increased, when improvement began. A Roentgenogram taken after three months shows marked diminution of thymus shadow. This child's general condition continues to improve, and he has no severe suffocative attacks. At times, however, stridor and dyspnea reappear in some degree, and an occasional treatment is given. In a personal conversation with the writer, Dr. Newcomet stated that he considered this case to be one of the so-called "glandular babies," and advised vigorous raying over large areas of the chest. This advice is now being followed.



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## ROENTGENTHERAPY IN HYPERTROPHY OF THE THYMUS GLAND.\*

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IN no line of recent medical research has greater interest been taken, nor more fruitful results obtained, than that pertaining to the ductless glands. Each of these organs by its separate action, and by its interrelation with others, has been shown to have effects upon the bodily economy which present a problem at once perplexing and fascinating to investigator and clinician alike. And some of the most interesting clinical questions centre about the thymus gland.

**Anatomy and Development.** In man the thymus develops as a paired organ from the ventral part of the third branchial cleft, at birth the organ lies behind the sternum, backward as far as the pericardium, reaching above so high as higher than the jugular notch. Accessory lobes lying within the thyroid or closely united with it may develop from the main organ. "The close association," says Noel Paton, "of such a structure with the original direct organ of the blood-flow to the body suggests the occurrence of some modification in the blood current for the tissues." This statement should be borne in mind when discussing the clinical physiology of the gland.

It consists of two lobes, each of which is lobulated, and each of which is composed of small globules. The lobules are separated by thin capsules, and the capsule of the whole gland is composed of a thin layer of connective tissue. The gland is situated in the upper part of the thorax, behind the sternum, and in front of the heart.

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called corpuscles of Hassall. They are invaded by polymorphonuclear leucocytes, and their protoplasm contains granules staining deeply with basic stains. The interstices of the epithelial groundwork are filled with lymphocyte-like cells, the nature of which is still under dispute, one school of writers asserting them to be true lymphocytes derived from outside, the others to be derived from the epithelial cells and hence really epithelial in nature. Upon this point depends, in large measure, the classification of the gland in its relation to the bodily economy, whether with the lymphatic apparatus, as was formerly supposed, or with the system of hormone producers. Without attempting to take sides in the controversy, it may be remarked that it is against these cells that the Roentgen-therapist in large measure directs his efforts, and that they react like other structures of known lymphatic character.

In man, as in most other animals, the thymus reaches its greatest size in relation to the body at the time of birth; thereafter it continues to grow, but at a reduced rate, growth ceasing only with the beginning of sexual maturity; it then atrophies, the essential tissue being replaced by fibrous tissue and fat, and is finally reduced to a mass of adipose tissue with a few islands of thymus remaining.

*Physiology.* That the secretion of the organ is essential to the normal development of infancy and early childhood seems definitely proven. Klose and Vogt,<sup>2</sup> by splitting the sternum, removed the thymus from 54 dogs. All the operated animals died in from three to seventeen months, after passing through certain definite stages. After a short latent period, characterized by ravenous appetite, they passed into a second stage of adiposity, in which they became heavier than their controls, with apathy and muscular weakness. Soon, however, the third stage of illiata thymica supervened, the animal becoming cachectic, clumsy, and stupid. A coma of several days followed, ending in death. The most important developmental variation in these thymectomized animals was found to lie in the small size of the skeleton and poverty of lime salts in the bones. The changes were those of osteoporosis and osteomalacia. In delayed ossification and diminished lime content they somewhat resembled rachitic change. The experimenters ascribed these conditions to a nucleinic acid intoxication, normally neutralized by thymus secretion.

The experiments of Svehla,<sup>3</sup> who by injection of watery thymus extract produced lowered blood pressure and eventual death in dogs, have been largely discounted by Popper<sup>4</sup> and other later workers, so that the effect of hyperthymization must be considered from the experimental standpoint is still unknown.

The interrelation of the thymus with other glands is beyond the scope of this paper. It is interesting in passing, however, to note its rela-

tion to the sexual organs. It had long been known by butchers that the thymus of castrated cattle was larger than that of bulls. Henderson, at the request of Noel Paton,<sup>5</sup> investigated this point. He found that the thymus of the castrated was nearly twice the size of that in uncastrated, and that its atrophy is delayed.

*Symptoms and Treatment.* In 1829 Kopp first described a disturbance of respiration due to persistent or enlarged thymus, which he ascribed to pressure upon the trachea. In 1858, however, Friedleben<sup>6</sup> stated very emphatically that "enlargement of the thymus is not to be considered as a cause of death." This pronouncement by so eminent an authority undoubtedly set back progress along this line for many years. In 1888, Grawitz reported two sudden deaths in infants, in which the autopsy disclosed an enlarged thymus. This was closely followed in 1890 by Paltauf's<sup>7</sup> description of the so-called "status lymphaticus," in which, he believed, though the thymus was enlarged in every case, the enlargement was not the cause of death. Hedinger,<sup>8</sup> however, in 18 autopsies on cases of thymus death, proved pressure in each case. Beneke<sup>9</sup> showed that the simple throwing back of the head was sufficient to produce pressure, and Jackson,<sup>10</sup> in 1907, demonstrated by bronchoscopy, direct pressure upon the trachea in a case of enlarged thymus without any accompanying signs of status lymphaticus. At about the same time Rehn,<sup>11</sup> by excising a piece of the gland and thus relieving the symptoms, proved them to originate from pressure. Not only may the thymus compress the right or left auricle, but by displacing the blood vessels cause irritation of the inferior laryngeal nerve, and thus cause spasm of the glottis, according to Crofti.<sup>12</sup> This, accordingly, is the view held by most observers today, despite some arguments for the internal secretion theory.

As seen in man, the pathology is practically always that of a simple hyperplasia. New growths occasionally occur, and congenital syphilis is believed by some to have a part.

The characteristic clinical syndrome of this affection is the so-called "thymic asthma,"—sudden severe attacks of dyspnea, stridor and suffocation. Most common in early infancy, it may occur as a sudden complication in other diseases in older children, in whom it may be a cause of sudden death. This latter condition is termed by D'Oelsnitz,<sup>13</sup> who first described it, as "latent hypertrophy of the thymus." Holt<sup>14</sup> recognizes thymus hypertrophy as a possible cause of convulsions in infants, without other signs. The dyspnea is of the expiratory type,—the stridor inspiratory. In many cases diagnosis can be made by percussion, the thymus presenting a roughly shield-shaped area of dullness, broadest above, and merging into the heart dullness below by an isthmus which varies in length and breadth according to the degree of hypertrophy.



The conclusions are as follows.

a. The laminaria salpingitis is characterized by its hemorrhagic tendency, its leucocytic pus and the absence of lymphocytes and plasma cells. The process is not always limited to the endosalpinx and may resemble phlegmonous inflammation of the wall of the tube.

b. Tuberculous salpingitis can easily be distinguished by the histological changes except in the very early catarrhal form in which the diagnosis rests only on the presence of the tubercle bacilli.

c. The salpingitis following appendicitis (endosalpingitis very rare) presents in itself nothing characteristic. Generally it is a perisalpingitis easily made out under the microscope.

d. In the acute stage of gonorrheal salpingitis there is a striking accumulation of plasma cells and of lymphocytes in the tissue and in the pus, by which early gonorrheal processes can be distinguished from septic processes. In the subacute and in the chronic stages the histological picture is nearly always characteristic for the gonorrheal and for the septic forms, but occasionally septic organisms produce adhesions of the endosalpinx and plasma cell infiltration. The character of the pus is distinctive, lymphocytic and with plasma cells in gonococcus infection, and leucocytic in septic cases. Yet a diagnosis is not always to be made by mere examination of the pus, for secondary infections are possible and do occur. In general, therefore, Wædtjen supports Schridde's views.

#### CONSERVATION OF THE TUBES.

Loehberg<sup>9</sup> reports a series of cases in which plastic operations on the uterine tubes were performed. The procedure was introduced into operative gynecology in 1885 by A. Martin, who designated it salpingo-stomato-plasty, meaning the opening by plastic operation of the abdominal tubal ostium which had been closed by inflammatory process, so as to give a permanent opening with permanent restoration of function. Skutsch advocated the term salpingostomy, which has persisted in general use.

The number of cases reported from various clinics has fallen off considerably in recent years, and little attention is paid to the operation in textbooks. The results have not been satisfactory as regards facilitating impregnation, for which various causes have been assigned. The tube may have been closed at the uterine end also, or the opening did not remain patent, through the formation of other adhesions. The disease, in the first place, having come from a gonorrheal infection, may have rendered the husband incapable of begetting children.

The danger of extrauterine pregnancy in the repaired tube has been emphasized, but as a matter of fact it is very slight, according to Loehberg. The only case reported was in a patient operated on for extrauterine pregnan-

cy; a plastic operation was performed on the closed tube of the other side, with a second extrauterine pregnancy about a year later. The actual number of cases of pregnancy is very small. The results, however, as far as secondary operations are concerned, are favorable, the mutilated tube rarely demanding another operation.

The series reported by Loehberg consisted of twenty-one cases, over a period of five years, and subjected to later examination as far as possible. The indications for operation are chronic inflammation without much obvious disease of the tubes, as marked distention from hydrosalpinx. Perisalpingitis with little disease of the tube would be favorable. Acutely inflamed tubes should not be operated upon, and if pyosalpinx is present on one side, no plastic operation on the other side should be attempted. The convalescence in the cases reported was about as in cases of salpingectomy. In two cases the abdomen was opened later, three and five years after operation, for conditions not connected with the pelvis and the tubes were found to be closed again. Only fourteen cases could be traced.

The subjective symptoms were much improved as a result of the operations, which had in fact been other than simple salpingostomies. Examination showed all but two cases to be normal; these had small masses in the position of the tubes. No pregnancy had ensued, either intra- or extrauterine.

The cause of the failure of these operations, Loehberg attributes to the technique of operation, the difficulty of obtaining an opening of the tube which is permanent and adequate to receive the ovum. The methods employed were splitting the tube, excising a piece to form a fenestra, cutting off the closed end of the tube, in all cases suturing the mucous membrane and peritoneum together and fixing the end of the tube to the ovary.

In spite of these bad results, Loehberg thinks the operation is indicated as a cure for sterility, (1) if the wife alone is at fault, and the history and findings suggest closure of tubes by inflammation; (2) as a conservative operation in disease of the tubes, of a chronic character, without much injury to the tube itself and always in young persons.

#### CAUSE OF TUBAL PREGNANCY.

Mall<sup>10</sup> presents a preliminary report on the cause of tubal pregnancy based on a study of one hundred and seventeen specimens. He gives a detailed account of the specimens in a later publication, Number 221, of the *Annals of the Entomological Society of Washington*.

Two aspects of tubal pregnancy are considered, the cause of the extrauterine pregnancy, and the fate of the closed ovary. The first aspect studied is so compact that it does not allow of condensation, but certain points may be noted. The cause of tubal pregnancy may be (1) a direct invasion



of specimens, which is accompanied by data bearing on the cause of tubal pregnancy, shows quite definitely that the condition is associated with inflammatory changes which must have preceded the lodgement of the ovum in the uterine tube." This inflammation affecting the tubal epithelium, or any other change which delays the ovum in its progress, will favor tubal pregnancy. Among these conditions are abnormal diverticula. To what extent inflammation outside of the tube interferes with the progress of the ovum in the tube is not clear. But it is found that "if the ovum within the tube contains a normal embryo, there is but little adjacent inflammation; if it contains a pathological embryo the changes in the tube are usually marked, and when the ovum is well disintegrated, the changes are still more pronounced. Read in the other way, this would mean that if the inflammatory condition is nearly healed, the ovum implants itself in the tube and grows normally, but if the results of infection are still pronounced, the ovum rapidly disintegrates. Such an inflammatory process is signalized not only by an inflammatory reaction in the tube wall, but also by very pronounced changes within the tube lumen, the most common of which is a condition known as follicular salpingitis."

"Another type of change differs markedly from follicular salpingitis, but in a way seems to go hand in hand with it. This condition may be spoken of as an outpocketing of the epithelial lining" into the muscular coat. According to the situation and extent of the pathological changes implantation occurs in the outer, middle or inner portion of the tube.

On the character of the etiology of the inflammation, the study of the specimens throws no light. But the history of the cases points strongly toward venereal disease as the chief cause of tubal pregnancy, though an infection at a previous labor is apparently the cause occasionally. For the extremely interesting discussion of the fate of the enclosed ovum, reference must be made to the original article.

#### VULVOVAGINITIS AND GONORRHEA IN CHILDREN.

Wolfenstein<sup>11</sup> reports briefly the results of treatment of gonorrheal vulvovaginitis in children. A point which he investigated with great care is the frequency with which there occurs at the same time gonorrheal infection of the rectum. In his series the percentage was fifty-four; the highest figure hitherto reported was thirty-eight. For this discrepancy, Wolfenstein is inclined to think that repeated examinations, during the whole course of the treatment of the vulvovaginitis, are responsible. In about one-half of the cases the diseases coincided at the beginning of the treatment; in the other half positive results were found on examination from eight days to eight weeks after the beginning of treatment. Generally the course of the rectal infection is without symptoms. In the

chronic cases there may be palpable and permanent lesions, as stricture, but the chief danger is that of reinfection of the vulva and vagina. The results of treatment tested by bacteriological examination indicate that in this situation the disease is at least as resistant as in the vulva and vagina. Of the cases under treatment, nearly all were finally discharged cured without permanent injury. On account of the danger of infecting the vulva and vagina, the rectal condition should be given treatment with silver salts.

Taussig<sup>12</sup> contributes a careful study of the prevention and treatment of vulvovaginitis in children. Reports from various cities indicate that this disease is not at all infrequent and bacteriological examination shows that nearly always vulvovaginitis in children is gonorrheal. A series of two hundred and sixty-two patients coming to a dispensary for various conditions was examined with reference to the presence of a discharge. If a discharge was found, examination was made for the gonococcus and it was detected in fourteen cases. In very few cases did the patient come on account of the discharge.

A study of the sixty-six sporadic cases in Taussig's series of gonococcal infections indicates that the source of the infection was rarely the parent, rarely from possible rape, rarely from infected clothing or from the bath, and rarely from other children by direct contact. The lavatory seat in the school seems to be the chief source of infection. Forty-seven of the sixty-six were of the school age.

The symptoms do not often cause much discomfort and the mother first notices the discharge. Occasionally ophthalmia or arthritis is the first manifestation of the disease. In the acute stage the patient may complain of burning on micturition or increased frequency.

In the way of treatment, Taussig recommends for the first two weeks rest in bed as much as possible, with vaginal instillations of twenty-five per cent. argyrol twice a day. For the third and fourth weeks, daily instillations of one per cent. silver nitrate; for the fifth and sixth weeks, two per cent. silver nitrate once in two days and from the seventh to the tenth weeks, four per cent. silver nitrate twice a week. In keeping up the systematic treatment the visiting nurse association has given valuable aid. The prognosis is generally favorable in time, but it is difficult to say just how soon a case will be cured or when it is actually cured. Ultimate danger to the child is probably not great, though occasionally a serious complication follows.

Prevention is the most important. Taussig's suggestions are as follows:

(1) Instillation of two per cent. solution of silver nitrate into the vestibule of all new born girls whose mothers show evidence of gonorrhea. Probably but a small number of infections come



the uterine cavity. The uterine wall was then closed over it and its pedicle.

Nine months later, on account of some increased pain in the pelvis and a mass on the right side of the uterus, the patient was operated upon again and the piece of ovary which had been left *in situ* was removed with a cyst the size of a child's fist. Some time later the patient had the signs of early pregnancy, but at the middle of the fourth month there was a uterine hemorrhage, with the expulsion of a mass of detritus, presumably a miscarriage, though not confirmed by microscopical examination. The uterus, however, rapidly decreased in size and the other signs of pregnancy disappeared.

#### FATE OF THE OVARIES AFTER HYSTERECTOMY.

Vineberg<sup>4</sup> discusses the fate of the ovaries after hysterectomy. The matter cannot be settled by experimental studies for comparatively few cases of hysterectomy come to secondary operation, and experiments on animals are no more than suggestive as the anatomical conditions are not strictly analogous. Searching the literature with some care, Vineberg finds numerous articles and comments on the subject, but no marked agreement of opinion. In fact, in some cases the ovaries have undergone little or no apparent change even a year after hysterectomy; in others there is evidence of congestion; in a third group there is atrophy, and in some there is "cystic degeneration" and a tendency to the formation of adhesions.

It has been suggested that interference with the blood supply, occurring practically always in the human, is the cause of anatomical changes in the ovary. At the present time all that can be said is that the ovaries may or may not be affected but probably will be because of interference with the blood supply.

In considering the effect on the function of the ovary, we are again unable to arrive at a satisfactory conclusion because we do not know enough of the cause and nature of the climacteric. In certain cases, following operation, there are no symptoms of the climacteric. In certain cases without operation the symptoms of the climacteric are marked. While it may be true that the symptoms of the climacteric, following operation, are due to trauma of the pelvic sympathetic nerves at operation, this explanation does not hold for patients who have not been subjected to operation. It seems better to regard the cause of the climacteric symptoms as something as yet unknown, than to attribute them to something which does not explain all cases.

The value of Vineberg's paper lies chiefly in the support it gives to the other side if anyone makes categorical or sweeping statements as to the effects of leaving or removing the ovaries at hysterectomy.

#### CORPUS LUTEUM CYSTS AND MENSTRUATION.

It may be said that in general menstruation is not affected by cyst formation in the ovary. Halban<sup>5</sup> has noticed for some years that in certain cases of cyst development, menstruation ceases suddenly. Such a case might easily be mistaken for extrauterine pregnancy. This coincidence of ovarian cyst and amenorrhea is not accidental, but has a causal relation, for such cysts are corpus luteum cysts.

It seems probable that the corpus luteum exercises a restraining influence on the appearance of the menstrual flow. Halban and Kocher<sup>7</sup> found that the extirpation of the corpus luteum in the human female is followed by the appearance of the menstrual flow. If the extirpated corpus is implanted in the abdominal cavity, menstruation does not appear. It is true that the premenstrual changes in the endometrium are due to the corpus luteum, but bleeding does not appear until the influence of the corpus luteum is removed or is diminished.

The explanation of the cases to which Halban has called attention is that with the formation of corpus luteum cysts there is a persistence of the effect of the lutein tissue far beyond the normal period of time; as the cysts atrophy, and sometimes they spontaneously disappear, menstruation reappears and if an actively secreting cyst be removed, menstruation recurs.

This point may be of some diagnostic value and will influence treatment, for corpus luteum cysts rarely need operation because they have a tendency to regress. "Alternating cysts," that is, cyst development in both ovaries at different times with spontaneous disappearance, are to be regarded as corpus luteum cysts. They are thin walled and thus easily ruptured during examination. It has been found also that their extirpation during pregnancy does not cause interruption of the pregnancy.

#### NERVES OF THE OVARY.

As the result of his extensive studies which he describes in detail, Wallart<sup>8</sup> comes to the conclusion that the relations of the nerve supply in the germinal gland are by no means as simple as has been hitherto generally supposed. In spite of the care of his own studies, he says that final judgment is not yet to be passed on the matter. The great wealth of the ovary in nervous elements, and its manifoldness consisting of internal secretion capacity, as well as corpus luteum, interstitial glands, and perhaps the decidua-like formations during pregnancy, cause the ovary to appear as one of the most complicated and interesting organs of the female, inviting detailed investigation. The author's investigation, "The nervous system of the ovary to the post of the corpus luteum," is a study of attention, as of late been noted, in view of the emphasis placed on the importance of the nervous system in the development of the female sex.



ance, although at present it is not understood at all.

#### OVARY AND ABDERHALDEN REACTION.

Solowjew<sup>7</sup> has found that in every case in which the presence of pregnancy could be determined with certainty, the Abderhalden serum test was positive, but that in cases in which pregnancy was not present the test was sometimes positive and sometimes negative. In ten cases in which the serum was from men the test was negative, but in one case, a woman certainly not pregnant, the test was positive. This suggested to him the possibility of the reaction depending in some degree on the ovarian function, and in two girls who had never menstruated he found the test was negative. This recalls the report of Kjaergaard who found strong proteolytic action in the serum of women during the premenstruum.

#### SALPINGITIS.

Waetjen<sup>8</sup> presents a careful and thorough study of the histology of suppurative salpingitis and its relation to the question of etiology. Since Schridde's publication in 1910 on purulent inflammations of the tubes, there has been very active interest and some polemical discussion. His thesis that gonorrheal salpingitis presented a characteristic histological picture has been rejected outright by certain pathologists and gynecologists, and has received support in varying degree from others.

The forms of salpingitis investigated are: (1) following dilatation with laminaria tents. In this group were forty-eight cases, in seventy-five per cent. of which there was found salpingitis. The pregnancy had been interrupted on account of advanced tuberculosis of the lungs, in nearly every case, and the tubes had been removed to produce absolute sterility. Clinically, the introduction of the tent was entirely benign in this series, as in series reported by others, but sixteen cases showed slight inflammation (endosalpingitis only), fourteen moderate grade of inflammation involving the muscular wall of the tube also, and six severe inflammation though no ulceration was observed. In no case could the inflammation be traced to the gonococcus or to early tuberculosis. The histological picture also suggested that a complete *restitutio ad integrum* was likely to follow. In non-pregnant women the tents produced no salpingitis.

(2) Tuberculous salpingitis. Here there is little cause, histologically, for confusion, because of the typical changes produced by the tubercle bacillus, but two points should be noted. Even in purulent salpingitis with tuberculosis the tuberculosis may be secondary, on the basis of an old inflammatory process, as Simmonds has pointed out; and there may be found a "catarrhal" salpingitis with no characteristic changes,

histologically, but with tubercle bacilli present. One of Waetjen's cases was of this very early form. In two cases in which there was a characteristic change in the wall of the tube and pus in the lumen, no caseation was present and no plasma cells were found in the pus.

(3) Salpingitis ex appendicitide. There is a frank difference of opinion between clinicians and pathologists as to the frequency of the spread of inflammation from the appendix to the tube. The clinician claims it is a frequent occurrence; the pathologist holds it to be rare. That such acute inflammation may involve the tube from the appendix is exemplified by one case in Waetjen's series. Perisalpingitis secondary to appendicitis is not infrequent. That secondary endosalpingitis may be of serious grade so as to cause a destructive process or pyosalpinx, there is grave reason for doubting. But the case of a girl of sixteen with the history of attacks of appendicitis years before, and with traces of an old destructive process in the tube also, suggests that the endosalpingitis following appendicitis may be serious in nature. Practically always the inflammation following appendicitis shows involvement from the serosa inward and not from the endosalpinx outward. Waetjen is inclined to agree with Pankow who says: "In all inflammations and adhesions of the adnexae and pelvic peritoneum, in which septic or gonorrheal infection from the uterus, or tuberculosis, can be excluded, we shall find by the microscopical examination of the grossly normal appendix the cause of the otherwise inexplicable pelvic changes."

(4) Gonorrheal salpingitis. The histology of gonorrheal salpingitis has been most thoroughly studied and accurately described by Schridde and Amersbach, as even the opponents of their views acknowledge, but that the changes they describe are characteristic of gonorrheal salpingitis is denied. In these cases there is formation of pus even very early, though the earliest cases cannot be distinguished from the cases of laminaria salpingitis except by the presence of the gonococcus and the abundance of lymphocytes. In the pus there are abundant plasma cells and epithelium. Only later is the loss of epithelium and the formation of ulcers found. There is fibrin in the pus but no sign of necrosis.

The plasma cells, on which Schridde has laid so much emphasis, are found in the wall of the tube, in the projections of mucous membrane especially, and also in the pus. This picture is found frequently, and perhaps in every case of gonococcal infection of the tube, but it is found also in a few cases in which the clinical evidence is against gonorrhea and no gonococci are found. Waetjen noted five such cases so that he cannot agree with Schridde that the gonococcus is the exclusive cause of ulcerative processes in the tube with marked plasma cell infiltration.



tend the second for my daughter, and the third I reserve for my old age."

This generous offer was not, however, accepted by the King, perhaps on account of court etiquette, or perhaps a sudden change for the better in the royal finances.

On the 13th of February, 1820, the King's nephew, the Duke de Berry, was mortally wounded by the hand of an assassin. The following account of the tragedy is drawn from Dupuytren's own report to the Academy of Medicine, and Cabane's graphic description, which was based on this report.

The Duke was on his way back to the opera, after conducting the Duchess, who was a few months pregnant at this time, to her carriage. He had just turned to go back to the theatre, when the assassin, Louvel, plunged a poniard into his chest. The Duke cried out, "*Je suis assassiné, Caroline, un prétre!*" Unfortunately, the Duke pulled the poniard from his chest, and the wound started to bleed fast. The patient was carried to the ante-chamber of his opera box, and here Dupuytren saw him. Bleeding, then almost universally done, had been accomplished from the arm. There was a question that the poniard was poisoned, and Dr. Bougon heroically applied his lips to the wound; luckily for him, this proved not to be the case. After consultation, Dupuytren decided to enlarge the wound and see if he could not stop the hemorrhage, which was exsanguinating the Duke. This exploration showed a penetrating wound of the chest, and all the surgeons present felt that further intervention was not to be thought of, and that nothing more could be done. The King, who had been anxiously awaiting the result of the consultation, addressed Dupuytren thus, "*Superestne spes aliqua salutis?*" and when Dupuytren replied in the negative, the King raised his eyes to heaven, saying, "*Que la volonté de Dieu s'accomplisse.*" The autopsy showed that the poniard had passed through the right lung, the pericardium, and had entered the right auricle. There were two litres of blood in the right side of the chest.

Notwithstanding the King's gratitude to Dupuytren for his services in this sad case, his treatment was severely criticised by his confrères, and most of them argued that non-interference would have been a better policy. Nothing could, however, have changed the result.

It is of interest that Dupuytren was made the hero of one of Balzac's novels, under the name of Desplein; the novel was the "*Messe de l'Athée*," and Desplein (Dupuytren) is described thus: "Desplein, one of the greatest of French surgeons, appeared like a meteor in the world of science. . . . Like all geniuses, he was without an heir. . . . The glory of surgeons resembles that of actors, which exists only in their life, and their talent is not appreciated when they are gone."

Sainte-Beuve, Malgaigne tells us, often spoke with pride of the fact that he had had the honor of being at the Hotel Dieu as one of Dupuytren's externs.

The following incident well illustrates the great surgeon's insight into human character. When patients came into the clinic suffering with dislocations, it was the practice of some surgeons to have the patient made somewhat intoxicated, so that there could be more muscular relaxation obtained, and the dislocation reduced more easily, and without danger. Dupuytren used other ways, as will be seen. A woman came into the clinic with a dislocation of the shoulder. Said Dupuytren, "Your hurt comes from the fall you have had, but you didn't tell me you were drunk when you fell; your son told me." The woman fell in a sort of swoon at this, and Dupuytren reduced the dislocation in an instant. When the woman recovered consciousness, Dupuytren said to her, "Your shoulder is in place, and I know perfectly that you only drink water."

In 1822 Dupuytren operated on a young girl for the removal of a tumor of the neck. When the tumor was nearly ready for complete removal from the surrounding tissues, there was suddenly a hissing sound and the patient suddenly expired. Dupuytren, without moving, looked long and searchingly at the operation wound, and then explained to the onlookers what had happened, that entrance of air into a large cervical vein had killed the patient. This was the first time this phenomenon had been demonstrated. It is said he gave on the spot, sadly and gravely, as befitting the occasion, one of his most illuminating lessons.

Cruveilhier tells us that when things were going wrong at operations, and in great emergencies, where life hung in the balance, that "Dupuytren was more than a man, he was the god of surgery."

One of Dupuytren's sayings was, "I have been mistaken, but I have been mistaken less than other surgeons."

It is not to be wondered at that his almost superhuman efforts, long continued without rest, should at last have their effects, and one day while walking to the Hotel Dieu in November, 1833, Dupuytren was seized with an attack of apoplexy; it was a slight attack, and he continued on his way to the hospital, but the students noticed that his speech was thick, and soon after this, in 1834, he was obliged to take a respite from his labors. He returned, however, and his passage to the cemetery was a long and timed ovation. Before going to the cemetery he said, "La republique des sciences est morte." He was buried with a pomp and a funeral which attracted the greatest interest of the city. The cause of his own case, although it was never definitely ascertained, was probably a cerebral hemorrhage. He was a man of great scientific and literary attainments, and a man of great social and personal qualities. He was a man of great personal qualities. He was a man of great personal qualities.



him, wishing, as he said, "To take above the news of this world." He died on the 8th of February, 1835, at the age of 57, and it is said that over 1000 workmen assembled at his grave, to pay their last respects to the Surgeon of the Hotel Dieu. Two hundred thousand francs were left to medicine by Dupuytren, and this sum was used under the direction of Orfila, for the creation of a pathologic museum, which is known as the Musée Dupuytren in Paris.

Pilastre has the following words concerning this great man, which fittingly end an account of his life.

"Posterity has forgotten the faults and errors that the contemporaries of Dupuytren rigorously reproached him with, . . . and has confirmed the homage which science, far away from the passion of the times, has rendered to the greatest surgeon of the nineteenth century,—a man who had lifted himself from the most humble to the highest rank, and added another name to the glories of France."

## Medical Progress.

### PROGRESS IN GYNECOLOGY.

By STEPHEN RUSHMORE, M.D., BOSTON.

#### TRANSPLANTATION OF THE OVARY.

As a result of Tuffier's<sup>1</sup> wide experience in transplanting ovaries, he has formulated "a new theory of menstruation." It is, briefly, that each month there is produced by internal secretion in the body of the human female, a chemical substance of unknown origin. When a sufficient quantity has accumulated, it acts on the ovary, which in turn reacts, modifying the secretion. It is this modified secretion which produces menstruation and is eliminated with the menstrual discharge. If menstruation does not appear, the retained substance produces "autointoxication," known clinically as the change of life. Part of this theory, namely, that menstruation is a cleansing process, has a familiar sound.

One fact on which this theory is based is that Tuffier brought on menstruation by injecting blood serum from a patient who was just about to menstruate. Furthermore, menopausal symptoms disappeared following such injection. Tuffier holds, therefore, that menstruation should be preserved whenever possible in women under forty. He estimates that about one-third of the endometrium should be left instead of performing a complete hysterectomy. As ovarian tissue also is necessary, this need may be supplied by autoplasmic operation, successful in a large enough percentage of cases to make it

a justifiable procedure. The ovary or ovarian tissue is buried without suture in the subperitoneal fat of the abdominal wall.

That the success of such grafting is not enough for the relief of menopausal symptoms was shown by several cases in which regular monthly congestive periods were observed, presumably corresponding to ovulation, but without menstruation. Only when menstruation occurs are the menopausal symptoms relieved. It was this observation that led Tuffier to the conclusion that the suppression of menstruation was the real cause of the symptoms.

One of the practical problems suggested is the treatment of young women from whom it is necessary to remove both ovaries on account of disease which precludes reimplantation. Grafts from other individuals have always been failures in the hands of Tuffier though he is still hopeful that improved technique, namely, increased knowledge of the conditions under which tissue grows, may ultimately give success here.

The literature on transplantation of the ovary is reviewed to date by Martin<sup>2</sup> whose conclusions may be quoted as follows. The surgical value of the procedure is questionable and the results are disappointing. Autotransplantation of ovarian tissue as practised at present seems to retard and modify the symptoms of the artificial menopause in a certain number of cases. Probably the effect depends on the ability of the graft to maintain its vitality in its new environment. A simple technique seems to give as successful results in autotransplantation as does a complicated technique with an attempt definitely to couple up the blood vessels. The occasional success of homo- and hetero-transplants suggests that the antagonism of tissue, which is nearly constant, may be overcome, though just how is not known, and more successful results be obtained.

Storer<sup>3</sup> presents a discussion of the question of ovarian transplantation, based chiefly on a study of the literature, and reports a case in which the operation was apparently followed by a pregnancy. The patient had had the left ovary and both tubes removed three years before on account of gonorrheal infection. She was desirous of matrimony conditioned on the possibility of pregnancy, and demanded operation though success seemed improbable.

At operation there were many dense adhesions and the ovary was found to contain many small cysts. The tubal stumps were half an inch long. The right tubal stump was divided downward until the uterine cavity was laid open. The ovary was bisected from above downward so that each half retained at least some of its original blood supply. The cut surface of the distal half was closed with catgut and left in place. The proximal segment was introduced into the incision in the uterus and sutured so that most of the cortex projected into



cision was postponed, and the candidates required to go through more tests, and to deliver in public a thesis, the subject of which was not to be known until four hours before the public discourse. Dupuytren was successful, and it has been said that he had prior knowledge of the subject of the discourse to Roux. Judged from our study of Dupuytren's life, this does not seem probable; at all events, Roux later admitted that he was too young for the position at the time he tried for it. This occurrence was the starting point of a bitter feud between the two men, which was to last for many years. Later in life Dupuytren and Roux fell in love with the same young woman, and Dupuytren again carried off the prize.

In the year 1805, Dupuytren was attached to the service of Boyer at the Hotel Dieu, and he was claimed by the army to do his work as a conscript. He was, however, so much wanted at the hospital, that the Ecole de Médecine, at a special session of the faculty, pleaded an exemption for him which was granted. In 1808, he was appointed adjunt at the Hotel Dieu, under Pelletan, a surgeon of the old school, of somewhat *laissez faire* principles. Some of the most interesting and important events in Dupuytren's life occurred at this time, of which Malgaigne tells us in a most graphic way. A word concerning the Hotel Dieu, for which Dupuytren did so much, will be of interest, for here the great surgeon lived and worked almost constantly, for thirty years.

The Hotel Dieu was founded by nuns in 660 A.D., and has been in existence uninterruptedly ever since, 1256 years. For years it was a hospice for the poor and destitute, as well as the sick, and many of the poor of Paris found refuge there during the long, cold winters. The overcrowding, disease, and general misery were too frightful to be described. In the times of epidemics the very high mortality was greatly increased. Some things had been changed for the better before Dupuytren's time, but the mortality was still very high, and there was great overcrowding. Dupuytren changed all this and made order out of chaos. At this time there were 1000 beds, and fifteen wards, but five of these were surgical. There were 264 surgical beds, 191 for men and 73 for women. Dupuytren gave two of his wards to Breschet and Sanson, respectively, keeping 113 beds on his service. Fourteen hundred ward cases (surgical) were treated in 1829. In the old days five or six patients lay in one enormous bed or *charnier*.

Such was the Hotel Dieu, where Dupuytren's famous lectures were delivered, the wonderful "Legons Orales," which thrilled countless audiences.

Dupuytren worked with all his energy while under Pelletan, and, studying the ward cases with minute care, soon had his lazy chief at his mercy, regarding all questions of diagnosis and operative procedure. Malgaigne tells us that

Pelletan, as chief of the service, had the right to assist at all operations he gave his subordinate, and he, in turn, had the right to visit all patients in the ward, after his chief. Dupuytren would tear to shreds with merciless logic all the fanciful diagnoses of his chief in the presence of the students. He was in his turn mercilessly criticised, but his critics, conscious of his great ability, were obliged to find other things to complain of than his operative skill. Thus Percy named him the first of surgeons and the last of men, and Lisfranc, the "Brigand of the Hotel Dieu."

It so happened that Pelletan wished to have his nephew appointed in his place at the Hotel Dieu when the time came, instead of Dupuytren, and as Dupuytren's whole future at the Hotel Dieu was at stake, if this was done, we cannot perhaps blame him for his attitude towards the senior Pelletan if all is taken into account. How Dupuytren became chief of the Hotel Dieu was told to Malgaigne by Lisfranc, who was a former pupil, and later a rival of Dupuytren. The climax of the trouble between Pelletan and his junior was reached when a Russian officer was brought into the Hotel Dieu, for a deep wound of the thigh, received eight days before. Pelletan examined the case, thought there was a deep abscess, which had come to the surface above Poppard's, and made a quick, deep incision over the mass, when a fountain of blood gushed up, inundating the operator and his assistants. The femoral was cut across! Pelletan hesitated; Lisfranc, who was assisting, states that Dupuytren had told him how to deal with such a hemorrhage, and applying his fingers with firm pressure over the common iliac, the hemorrhage stopped. Pelletan, thinking it was the place itself he had wounded, and not being familiar with the ligature of large vessels, in common with many other surgeons of his time, made two parallel incisions above Poppard's ligament, passing a Deschamps' needle deeply between, then ligating the risses between, upon passing the abdominal wall as well as the deeper structures in the ligature, which he then tied tightly. He then asked Lisfranc to suspend the compression, which he reluctantly did. A few minutes hemorrhage showed that the vessel had not been included in the ligature, and despairing Pelletan crowded chloride of lime deep into the wound, but all to no purpose, as the hemorrhage continued. A fortunate officer was present, who, naturally caused much interest, and the Russian surgeon's recommendation was followed.

It was a very fortunate thing that the Russian surgeon was present, for the hemorrhage stopped, and the patient recovered. Pelletan was so much mortified by this, that he resigned his position as chief of the service.

Dupuytren was now chief of the service, and he was not long in making his mark. He soon had his ward cases under his eye, and he was not long in making his mark. He was not long in making his mark.



was appointed to this position on September 9, 1814, and two years before this he had been appointed professor of operative medicine.

It is of interest to note, particularly at this time, that in connection with his work at the Hotel Dieu, Dupuytren established a dressing station in the centre of the French lines during the revolution of 1830, and remained there all day under fire, with his interns, attending to the wounded. From 1802, the time of his first appointment at the Hotel Dieu, until 1835, he hardly missed a day, a period of over thirty years. Lenoire says, "We have seen him sick, febrile, icteric, accomplishing the rigorous duties which he had set himself, omitting nothing."

What manner of man was this king of surgeons and surgeon to the King? Probably no great man was ever more hated and envied, and at the same time more looked up to for his consummate skill. Gaillard tells us that he was of commanding figure; one could easily recognize the "grand maitre," a noble head and a forehead worthy of Jupiter Olympus. His words were usually brief; he had a tone of voice which had a finality about it which admitted of no discussion and no reply. His dress was of the simplest, and ordinarily he was negligent in this regard,—an old green coat, socks over the tops of his boots, he walked the wards of the hospital every inch a king, and woe be it to the person who thought they could presume, on account of his eccentric dress! He did not indulge in any luxuries, his whole mind and body being given to his work. It is said that he disliked compliments excessively, and the "flatteries which lay unction to the soul of the little great."

Pariset tells us that he criticised or blamed no one, which is probably untrue, as we know from studies of his early days at the Hotel Dieu. He certainly had reason in the "penible" beginnings to blame and criticize many. His expression was not, we are told, like the coldness of marble, but was somewhat preoccupied, giving the idea of one rapt in meditation. He would visit the hospital at six or thereabout each morning, and if all the house staff were not at attention, or any were missing from their proper place, there was trouble. He examined all the patients with great care, and laid great stress on a careful history, and repeated physical examinations. After the visit he would sit down on his big green sofa, which his assistants and students loved as part of himself, and talk over the cases. There was a special house-officer, whose business it was to make a *careful and minute record of all the unusual and interesting cases, the records of their operations, and to do nothing else.*

After the operations were over, and the cases in the wards had been visited, Dupuytren made it a rule to be present at any autopsy of a case in his wards, and he was the first surgeon to follow out this rule in France. "About eleven A.M., he took the little roll of bread given to the surgeons from time immemorial at the Hotel

Dieu, and without thinking anything about his old green coat with the holes at the elbows, walked along the pavements, munching his meagre crust." At this time, as Gaillard quotes, "*Nul autre à ses cotés live un front rival.*" Always at about seven in the evening he would make a second visit at the hospital to see the operated cases of the morning, and any others demanding attention. Dupuytren's private practice was slowly acquired, but at the zenith of his powers reached immense proportions. It is estimated that at this time he saw ten thousand patients yearly, outside his hospital work. With all this immense amount of labor, Dupuytren did not write as much as some of the other great French surgeons of his time, but what he did write was of the best. Much of this is contained in the "*Leçons Orales*," which were gathered in book form, and published by his pupils, Pierre de Boismont and Marks. Among the most interesting of these lectures to us today are perhaps the ones on bone cysts, abscess of the right iliac fossa, including appendicitis, and congenital dislocation of the hip. In the essay on bone cysts we find much that sounds as if it were written today, so clear is the knowledge of the condition, bone cyst occurring in the long bones, etc. Warning is given that bone cysts are liable to become malignant, and complete extirpation is advised. Dupuytren made an extensive study of gunshot wounds, and also began a work on stone in the bladder, which was finished by Sanson and Beggin. Perhaps the only work he is universally remembered by to this day, is his memoir on contracture of the palmar fascia, and its operative cure. He made a study of tuberculosis, and anthrax, and made an exhaustive study of burns, making a new classification. He was the first surgeon to amputate the cervix of the uterus for cancer, and the first to devise a rational procedure for excision of the lower jaw. His operation for the establishment of an artificial anus was one of his greatest triumphs. His work on fractures, and especially fractures of the fibula and the lower end of the radius, is classic.

No sketch of Dupuytren would be complete without a brief account of his relation to the Court of France, and the part he played in the sad event of the assassination of the Duke de Berry.

In 1816, he was created a baron, and the Order of St. Michael was conferred upon him, and in 1820, he was made consulting surgeon to Louis XVIII, and on his death, in 1821, he was appointed surgeon to Charles X. At this time Dupuytren had acquired great wealth, and being cognizant of the condition of the Royal exchequer, sent the following note to the King.

"Sire: Grace in part to Your benefactions, I possess three millions; I offer you one. I in-



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## PROSPECTIVE MEDICAL MEETINGS.

THE seventh annual meeting of the American Association for Study and Prevention of Infant Mortality will be held at Milwaukee, Wis., on October 19, 20 and 21, 1916, under the presidency of Dr. S. Max Hamill of Philadelphia. The subjects to be discussed at this meeting include federal, state and municipal governmental activities in relation to infant welfare; the care available for mothers and babies in rural communities; standards for infant welfare nursing; and morbidity and mortality in infants from measles and pertussis. The session on measles and pertussis will be held in conjunction with the Milwaukee County Medical Society. The work of the meeting will be divided between the sections on obstetrics, propaganda, pediatrics, vital and social statistics, public school education for the prevention of infant mortality, and rural communities and nursing and social work.

The annual business meeting will be held on October 20, at which will be presented the reports of affiliated societies through which the association is in touch with activities for the prevention of infant mortality in seventy-six cities representing twenty-eight states, the District of Columbia, Canada and the Philippine Islands. The Association was organized in November, 1909, following a conference held at Yale University by the American Academy of Medicine. Its objects are to study the causes of infant mortality, to awaken interest in the possibility of its reduction, to formulate plans for its prevention, and to act as a clearing-house for the collection and dissemination of information on these subjects. The headquarters of the Association were established at Baltimore in 1910. Its work is carried on by correspondence from the central office, by investigations and studies made by standing and special committees, by its annual meeting, and the publication of its transactions and by a traveling exhibit. It has over 150 affiliated organizations and 950 individual members.

Members of this Association who attend the meeting in Milwaukee, are invited also to attend the forty-fourth annual meeting of the American Public Health Association, under the presidency of Dr. John F. Anderson of New Brunswick, N. J., which will be held at Cincinnati, from October 24 to 27. The program of this meeting has been adopted as the official program of the annual municipal health officers' conference of Ohio. At the general sessions of this meeting there will be symposia on mental hygiene and public health nursing. There will also be meetings of the sections of public health administration, laboratory, vital statistics, sanitary engineering, sociology, and industrial hygiene. This Association was established in 1872, and its membership includes the health officers of the leading cities in the United States and Canada, the executive officers of many state and provincial departments of health, the leading officials of the United States and Canadian Government health services, and many bacteriologists, chemists, sanitary engineers and sociologists.

The seventh annual session of the United States Congress of Surgeons of North America will be held at Philadelphia during the week of October 23, 1916. An elaborate financial program has been arranged at the various hospitals of the city in accordance with the custom of the Congress. There will also be a conference of the



sions, at which papers will be presented. The presidential meeting will be held on Monday evening, October 23, at which Dr. Fred Bates Lund, of Boston, will be inaugurated and will deliver the presidential address on "The Indications of Cholecystectomy." There will be other papers on gall-bladder surgery, by Dr. J. M. T. Finney of Baltimore and Dr. Charles H. Mayo, of Rochester, Minn. The evening session of Tuesday, October 24, will be devoted to renal and vesical surgery, and that of October 25 to gynecology and obstetrics. On these days, also, there will be a special symposium on ophthalmic, rhinological and laryngological surgery. On Thursday evening, October 26, there will be papers by Dr. C. A. Porter of Boston on "Surgery of the Peripheral Nerves," and by other surgeons of distinction on various aspects of the cancer problem. On Friday evening, October 27, a public meeting will be held under the combined auspices of the Philadelphia County Medical Society, the department of public health and charities, and the Clinical Congress of Surgeons of North America. At this meeting Dr. Weston A. Price of Cleveland will speak on care of the teeth, Dr. Joseph C. Bloodgood of Baltimore on diagnosis of cancer, and Dr. Robert W. Lovett of Boston on curable deformities and the importance of their proper treatment.

It is expected that the limit of attendance for this Philadelphia meeting will be reached some weeks in advance of its opening, so that those surgeons who wish to attend but have not yet registered are urged to apply to the secretary-general, Dr. Franklin H. Martin of Chicago. The Clinical Congress of Surgeons of North America has become an established factor in the surgical life of this country, and this annual meeting for 1916 promises to prove as attractive and valuable as its predecessors have been. It is a matter of local congratulation that this Congress is to be held under the presidency of a Boston surgeon, to whom the JOURNAL takes pleasure in extending its good wishes for his tenure of this honorable and distinguished position.

#### A PSYCHIATRIC CLINIC FOR PRISONERS.

THE establishment of a psychiatric clinic by the Rockefeller Foundation in Sing Sing prison marks a long step forward in dealing with this

class of offenders against society. Every one is familiar with the work done by Warden Osborne and his Mutual Welfare Society, but now we are approaching the problem from another, more scientific, side. Whether the results will be as encouraging or not remains to be seen. Certainly the work would seem to be directed against the very nucleus of the problem,—the mental make-up of the criminal, which led him to crime, the possibility of a readjustment of his attitude towards life, and the therapeutic indications for cure.

The actual work of the clinic began August first, under the direction of Dr. Bernard Glueck, formerly of the Government Hospital for the Insane, where he had been for six years in charge of the Howard Hall Department, where are sent all federal prisoners who become insane. Glueck has already contributed largely to the literature of insanity among criminals, and is the author of a work, "Studies in Forensic Psychiatry," which is now in the press. He is one of the American exponents of Alfred Adler, and it will be interesting to observe whether or not his studies of neuroses among prisoners will bear out Adler's views of organ-inferiority rather than Freud's sexual etiology or Jung's libido concept.

It is high time, indeed, that some effort was made in this country to investigate the mental status of the habitual criminal, especially the vagabond type of Kraepelin. It will surprise no one who has had any acquaintance with psychiatry to find that a large percentage of these individuals are defective in some way,—high-grade imbeciles, psychopathic characters, constitutional inferiors, or abortive precoces.

The most important part of the work of the new clinic, however, will be the determination of the future of such cases. Many solutions have, of course, been offered in the past. Sterilization, reëducation and permanent segregation are the three chief. Without taking the space here to discuss the matter more fully, it is probable that the most satisfactory disposal of the State's habitual criminal would be the establishment of a colony where they could be definitely separated from society as a whole for an indeterminate time, possibly for their lifetime. However, we shall see what the new clinic has to offer along this line. Certainly we may expect from Dr. Glueck a comprehensive study of the subject and illuminating contributions to its literature.



fifth, was very anxious that the possibility of conception should not be removed, though she realized the danger to herself. The operation which Stoeckel performed was to make incisions as for the Alexander-Adams' suspension of the uterus, opening the peritoneal cavity, however. The tube was then drawn up and buried for its outer one-half beneath the peritoneum. By using fine catgut in the serosa only of the tube and employing great care, there was almost no trauma to the tube. The result so far has been entirely satisfactory. Whether the tubes will later be opened and whether then conception will occur, cannot be told, but the operation would seem to offer a possible method of inducing temporary sterility.

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## Book Reviews.

### *The Kinetic Drive, Its Phenomena and Control.*

By GEORGE W. CRILE, M.D., Professor of Surgery, Western Reserve University, Philadelphia and London: W. B. Saunders Co. 1916.

This small volume presents the text of the Wesley M. Carpenter Lecture delivered by the author before the New York Academy of Medicine in 1915. It is a preliminary epitome of a projected monograph which will offer complete experimental evidence upon which the themes and postulates of this essay are founded.

By kinetic drive Dr. Crile indicates the state of increased energy transformation characteristic of modern human civilized life. This increased activation is secured by the kinetic mechanism of the adrenals and the thyroid. As kinetic diseases the author describes Graves' disease, cardio-vascular disease, Bright's disease and diabetes. He differentiates between acute and chronic emotional activation by means of the kinetic drive and outlines the means of its medical and surgical control. The operative

treatment of these kinetic diseases he describes briefly as dekineticization. The work is illustrated with a series of twenty-one excellent figures, many of which are full-page plates. It is an admirable and interesting preliminary statement of a new development of the author's now familiar theory of nociceptor stimulation. The publication of the completed work will be awaited with attention.

### *Diseases of Occupation and Vocational Hygiene.*

Edited by GEORGE M. KOVER, M.D., LL.D., Washington, D. C., and WILLIAM C. HANSON, M.D., Belmont, Mass. Philadelphia: P. Blakiston's Son & Company, 1916.

This volume, edited by two well known industrialists and sanitarians, presents the contributions of 29 selected experts on various aspects of industrial diseases and the hygiene of vocation. The work is prefaced by a historical review, by the editor, of the development of industrial hygiene and of its progress in the United States. The text of the book is divided into three parts, of which the first deals with specific and systemic diseases of occupation, with fatigue and the neuroses; the second with the causation and prevention of the diseases and accidents of occupation; and the third with the methods of investigation employed in the study and control of industrial conditions from the hygienist's standpoint. The book is illustrated with 46 cuts and a number of reference pages. Particular attention is directed to the chapters on diseases and hygiene of the ear, skin and nervous system and on those relating to carcinoma and the diseases of animals important in industrial connection. The volume should establish its value as a standard textbook of these subjects of new and growing popular and professional concern.

*Diagnostic Methods.* By HERBERT THOMAS BROOKS, A.B., M.D., Professor of Pathology, University of Tennessee. Third edition. St. Louis: C. V. Mosby Co. 1916.

This third edition of Brooks' laboratory manual of clinical chemistry, appearing so long at a time after the publication of its predecessor, is evidence that the book has proved itself among many similar works. It is intended as a guide for history taking, recording, and routine physical examinations and the laboratory tests necessary for studies in clinical pathology, for hospital use, and for consulting physicians. It is written for those who have only a limited knowledge of chemistry, to give to laboratory workers a guide which has been carefully revised from time to time, as obsolete tests have been discarded and new ones added, and there is a complete chapter on the topic of staining and examination of smears and slides. The book is illustrated with 100 figures.



*The Physiology of the New-Born Infant. Character and Amount of the Katabolism.* By FRANCIS G. BENEDICT, M.D., AND FRITZ B. TALBOT, M.D., Carnegie Institution of Washington. Publication No. 233.

This contribution from the Nutrition Laboratory is a report of one phase of the study of new-born infants by Drs. Benedict and Talbot, that has been going on for several years, and of which other phases have been reported in other places. This report shows that the view so generally prevalent of a large storage of carbohydrate in the human embryo, is probably not altogether in accord with the facts, although it appears that the metabolism is more nearly of the carbohydrate type the sooner after birth the determinations are made. These authorities show clearly that it is only a matter of a few hours before whatever reserve of carbohydrate may have been present is exhausted, and the infant is thrown upon its tissues (chiefly fat) for its energy supply. In the light of this fact they discuss the question of proper dietetic treatment of the new-born. They show that colostrum, although admirable in substance, is not sufficient in amount to serve the full requirements of the young infant. They suggest, moreover, that since the early metabolism is not carbohydrate, as has been supposed, there is a possible danger of acidosis if the metabolism is over-accentuated. The importance of preventing undue muscular exertion on the part of the new-born infant, as in excessive crying, is shown, and the possibilities of artificial nourishment at this period discussed. The report is well worth the careful attention of pediatricists and others who are interested in the problems of infant nutrition.

*A Manual of Gynecology and Pelvic Surgery for Students and Practitioners.* By ROLAND E. SKEEL, A.M., M.S., M.D., Associate Clinical Professor of Gynecology, Medical School of Western Reserve University; Visiting Surgeon and Gynecologist to St. Luke's Hospital, Cleveland; Fellow of American Association of Obstetricians and Gynecologists; Fellow of American College of Surgeons. With 289 illustrations. Philadelphia: P. Blakiston's Son & Co. 1916.

"This manual is intended to furnish a concise, practical working knowledge of gynecology with especial emphasis upon diagnosis and treatment." The intention of the author has been carried out well along established lines. The text is much better than the illustrations, which need more completely descriptive legends to enable them to fulfill their purpose. The lists of references to the literature are a feature which

other American textbooks of gynecology would be wise to adopt. They are not intended to be complete, but they serve to indicate quickly where further treatment of a subject may be found. There are a few typographical errors which might be misleading, as the legend below Figure 266. In general the book is quite up-to-date and its estimates of recent innovations are just. In its field, the book should prove a distinctly useful addition to the works on gynecology.

*Progressive Medicine.* Vol. xix. No. 2, June 1, 1916. Edited by HOBART AMORY HARE, M.D., assisted by LEIGHTON F. APPLEMAN, M.D. Philadelphia and New York: Lea & Febiger.

This number of *Progressive Medicine* presents the usual digest of progress in medical and surgical sciences during the preceding quarter. Under the subject of "Hernia," particular attention is devoted to the relation of this condition to the Workmen's Compensation Law. Surgery of the abdomen and gynecology are separately considered. Under the latter, Percy's heat method in the treatment of inoperable uterine carcinoma is discussed in detail and illustrated by several figures. Under "diseases of the blood" are considered diathetic and metabolic diseases, diseases of the thyroid gland, spleen, nutrition and lymphatic system. There is a brief terminal section on ophthalmology. The volume is a valuable contribution by a score of well-known American experts to the literary record of recent progress in the medical and surgical sciences.

*The Practitioner's Medical Dictionary.* By GEORGE M. GOULD, A.M., M.D. Third edition revised and enlarged, by R. J. E. SCOTT, M.A., B.C.L., M.D. Philadelphia: P. Blakiston's Son & Co. 1916.

The two previous editions of Gould's Medical Dictionary have been reviewed in former issues of the JOURNAL with approval. This third edition, based on recent medical literature and containing all the words and phrases generally used in medicine and allied sciences, with their pronunciation, derivation and definition, is issued to bring the publication to date by the inclusion of new and current words and terms, and of words from the sciences allied to medicine. About 20,000 such new terms have been added making a total of over 70,000 words in the dictionary. The work is illustrated with many tables and a few cuts. The author and the editor are to be commended for retaining the Greek letters in their etymologic descriptions. The book should continue to fill its useful and established position as a reliable and complete medical dictionary.



of urine, due to a multitude of individual causes; then causes which lower the vitality of the body in general and of the bladder in particular, as depressing illness, toxemias, exposure to cold. Probably the greater mobility of the right kidney explains the increased frequency of infection found there.

The exciting causes are bacteria, coming from infectious foci anywhere in the body, especially if in or near the intestinal tract. It seems as though the bacteria from these foci originate the urinary disease and the colon bacillus is a secondary invader. Perhaps the answer to the first question is that they are not susceptible except when infected by some other organism first.

The weight of opinion at present is that these urinary infections are chiefly hematogenous in origin; some are due to lymphatic extension and a few are examples of ascending infection.

The natural course of these infections is short and acute, from five to twelve days. They tend to recovery unless there is persistence of some predisposing or exciting cause. This should be kept in mind and such cause or causes looked for and removed. Especially is this true in cases of relapse or chronic infection. If the course is chronic there is a tendency to suppuration of the kidney, or gradual destruction of the renal function.

The most satisfactory treatment in the acute stage is keeping the patient in bed, administering large quantities of water with urotropin and the application of heat to the lumbar region. When the acute symptoms have subsided, Furriss finds autogenous vaccines of benefit. Pyelitis, if persistent is treated with weak solutions of silver nitrate, but in every case a most careful search must be made for the cause of the trouble. This and the amount of damage already done to the kidney determine the treatment and whether operation is or is not indicated.

#### CALCIUM IN PELVIC DISEASE.

Of late years so much attention has been devoted to the operative treatment of various forms of disease, that too often the non-operative treatment has been neglected, and it is the non-operative treatment of inflammation in the pelvis that Landsberg<sup>21</sup> recommends. In this condition it is no longer considered good surgery to subject every case to operation, and there is considerable evidence as to the value of non-operative treatment, certainly in the acute stage.

Calcium has been found to be of value in combating inflammatory processes, and for about a year Landsberg has used calcium lactate in the treatment of acute pelvic inflammatory disease. The number of cases (eighteen) is too small to form a basis for far reaching conclusions. But under the administration of calcium the progress seemed more rapid than under other methods of treatment, which were

tried first. Calcium is now used in connection with other means of relief and employed in the form of a one per cent. solution, which is injected hypodermically. Not more than three cubic centimeters should be introduced at any one point, as it may cause marked skin reaction. The total maximum dose should never exceed ten cubic centimeters. The injections are repeated every two or three days, as near as possible to the inflamed area. For vaginitis a five per cent. solution is recommended.

Another condition of which the treatment is discussed by Landsberg is the bleeding of puberty as well as of the climacteric, without obvious cause. There may be supposed some "dysfunction" of the ovary or of the uterus to account for it. Landsberg has employed extract of corpus luteum, prepared for hypodermic injection. The seven cases treated were cured, using one cubic centimeter of the preparation every two days, and observation for months afterward showed that the effect was not transitory.

#### GYNECOLOGICAL AFFECTIONS AND TUBERCULOUS DISEASE.

Butner<sup>22</sup> calls attention to the importance of making a thorough general examination in patients who complain of pelvic symptoms, but in whom there is little or no anatomical basis for such symptoms. In these obscure cases, of which he cites several examples, he has found, usually after he had been treating the patient for some time for pelvic disease, that the pelvic symptoms were due to tuberculosis of the lungs. It is this particularly which should be kept in mind in any obscure pelvic condition characterized by physiological rather than by anatomical abnormalities.

#### GYNECOLOGICAL DISEASE IN THE INSANE.

Gibson<sup>23</sup> reports a series of one hundred operations for gynecological disease in the insane. The question of the advisability of operations for the relief of gynecological conditions has received considerable attention of late, with some polemical discussion as a result of Bossi's contributions to the literature, but not many writers have attacked the subject systematically. The reports of series of cases have in general been of little value, for no effort has been made to classify the psychoses found. This is probably due to the fact that the operators are not familiar with psychiatry and depend on his associates to select and tabulate his cases.

Gibson has arbitrarily divided the various forms of insanity into two groups. 1. Forms in which there appear various degrees of deterioration or dementia, and 2. Forms in which dementia does not appear. For the first group of cases there is little to be gained by operation, except that it may improve the physical condition, and make it easier to care for the patient. In the second group of cases the re-



sults of operation may be beneficial, for if definite lesions were corrected it may be thought that some effect on the psychosis can be determined. To prove this will take long series of cases, and the patient observation over long periods of time. Immediate results are not conclusive.

The immediate results in a series of one hundred cases are reported by Gibson, however, the mental condition of the patients being determined by the staff of the Kings Park State Hospital. Of these, fifty-five belonged to the first group in which no benefit was to be expected and none was actually found. Seventeen of the second group were considered by the staff to be benefited by the operation. Of twenty-six of the manic depressive group, thirteen were improved, or fifty per cent. But, of course, a long period of observation is necessary to determine permanent results. The operative mortality was one per cent., death resulting from a pontine hemorrhage the day after operation.

The earlier investigators gave a large percentage of improvement, some even as high as sixty-eight, while later writers give from sixteen to eighteen per cent. The author agrees with Tauszig's conclusions that every woman with manic depressive insanity should have a pelvic examination, and if a definite lesion is found, it should be corrected by local treatment or operative measures.

#### NERVOUS PHENOMENA FOLLOWING OÖPHORECTOMY.

Gordon<sup>24</sup> has seen so many ill-advised operations on the female genitalia, that he presents a summary of some of his experiences. If the ovaries are removed the effects are far reaching and multiform, as can be seen by the changes which take place in the other glands of internal secretion. The equilibrium of the system is upset and there arise distinct disturbances, chiefly functional. It is the nervous and mental disturbances which Gordon considers especially in his paper.

The series covers one hundred and twelve cases, in thirty-seven of which oöphorectomies were performed through errors in diagnosis. In thirty-four women who complained of various manifestations of neurasthenia, psychasthenia or hysteria, there was complaint, among other symptoms, of vague disturbance in the abdomen. Oöphorectomy was advised and was carried out. The organs were found to be normal, but the immediate effect of the operation was beneficial in some, yet without effect in others. Later the symptoms became worse in all.

In the remaining seventy-five cases, there was some disease of the pelvic organs; radical operations having been advised and accepted were performed. While operation removed some local symptoms, others more severe with mental and nervous disturbances developed in the months following operation. Some of the patients, though not actually insane, required care in an institution.

Gordon urges that, since the removal of the reproductive organs produces such profound mental and nervous symptoms, they be not removed for slight cause or for no cause at all, as in some of the cases he saw. A more thorough study of the patients who complain of nervous symptoms or of pains of a vague character should be made by a neurologist before the operation is decided upon.

#### COAGULEN IN PELVIC SURGERY.

Albrecht<sup>25</sup> encouraged by the favorable results of the use of coagulen reported by Fonio, Kocher and others, has employed it in gynecological conditions. Coagulen is a substance which hastens the coagulation of the blood; it was prepared by Fonio from animal blood platelets, and has been placed on the market by a Swiss firm. Its effect is described by Fonio as hastening and increasing the coagulation of the blood. This is very marked in the test tube, but if given subcutaneously or intravenously, it produces quickly a transitory shortening of the coagulation time of the circulating blood.

The trade form is a powder, but a ten per cent. solution should always be freshly prepared for administration. The cloudy solution may be boiled for two or three minutes without impairment of its action. The bleeding surface is sponged off and immediately a pack wet with the solution is applied.

Albrecht's experience may be summarized briefly. Coagulen works promptly in parenchymatous oozing from raw surfaces. In arterial bleeding and in any considerable venous bleeding, it is of no value, for the blood pressure quickly displaces any clots which may form. The field in gynecology and abdominal surgery is thus chiefly intraperitoneal, in oozing from raw surfaces in the pelvis or on the intestine. If the pack is removed with care, no bleeding occurs, and no post-operative bleeding has been reported.

A substance which checks bleeding so satisfactorily has been used, of course, for many hemorrhagic conditions, for example, in the essential menorrhagia in young girls, where it was given hypodermically (quite painful). But after twelve hours there is no appreciable effect on the blood. Intravenous injection has been followed by collapse in several instances and may be regarded as too dangerous. In melena neonatorum as in hemophilia, its use has been followed by the desired result. But in abdominal and pelvic surgery, it is a certain and rapid local styptic in parenchymatous bleeding from raw surfaces.

#### FACULTATIVE STERILITY.

Stoeckel<sup>26</sup> has practised a new method of operating to produce "facultative sterility." His patient who had had five children in five years, with a psychosis in the fourth pregnancy which appeared again in a more serious form in the



in this way, but no harm is done by this treatment.

(2) Making vaginitis in children a reportable disease, as the disease nearly always comes from outside the family and the patient is innocent.

(3) Instruction of parents of infected children—through the visiting nurse—regarding preventive measures to limit infection.

(4) Investigation by the visiting nurse as to the probable origin of the infection with a view to preventing contamination of other children.

(5) Adoption of the U-shaped seat with the low bowl and other precautionary measures to prevent spread of infection through public lavatories in schools, play grounds, comfort stations and tenements.

"Gonorrhea in adults is so intimately connected with the public morals that any marked diminution in its presence seems like trying to reform the universe. Gonorrhea in little girls, on the other hand, is simply the result of inadequate sanitary precautions . . . a disgrace to the hygienic methods in the beginning of the twentieth century."

#### VAGINITIS.

Hoehne<sup>13</sup> attributes to the activity of the *Trichomonas vaginalis* a characteristic form of vaginitis. The parasite has already been recognized as an inhabitant of the vagina, and in association sometimes with inflammation, but generally it has been considered as of no pathogenic significance. Hoehne reports a series of twelve cases which he selects from a series of over a hundred, in which he found abundant masses of the infusoria, varying forms of bacteria, but no gonococci. The discharge was rather thin, abundant, yellowish and foamy, irritating and causing marked inflammatory reaction, occasionally ulcers. Subjectively the symptoms vary but were chiefly burning and itching, sometimes so severe as to interfere with patient's occupation.

In a series of one hundred and four non-pregnant women, the parasites were found twenty-nine times, and in a series of one hundred and two pregnant women, thirty-five times. That is, in nearly one-third of the cases examined, the trichomonas was present, never with the gonococcus, though often with other bacteria. He describes at length the technique employed in fixing and staining the parasites, but defers until a later paper a discussion of the therapeutic measures which he has found so successful.

#### VAGINAL BACTERIA AND MENSTRUATION.

Hellmuth<sup>14</sup> has conducted a series of investigations to determine, if possible, whether menstruation has any influence on the hemolytic properties of the bacteria in the vagina.

It is very unusual to find hemolytic streptococci in the vagina during pregnancy, but they are not infrequent in the lochia even in patients who have no elevation of temperature. The significance of the hemolytic property is not at all understood. By some it is regarded as a definite characteristic property, especially in the virulent strains of streptococcus. By others it is thought that hemolysis has nothing to do with virulence, but is simply due to the blood content of the nutrient medium and is, therefore, a purely accidental peculiarity which the different bacteria causing puerperal fever assume under certain as yet unknown conditions. If the presence of blood in the medium is then a determining factor, hemolysis would be expected in continued bleeding as in prolonged menstruation or in menorrhagia.

Hellmuth investigated carefully in both in- and out-patient departments of the clinic, under very rigid precautions, to prevent contaminations. In three cases out of thirteen, there were found hemolytic bacteria, one in- and two out-patients. The in-patient had a purulent abdominal incision and hemolytic bacteria were found on the external genitalia as well as in the vagina. The two out-patients could not be controlled, of course, and the germs may have been introduced at coitus. But in twenty-two examinations during and in the first three days following menstruation, there was no trace of hemolytic bacteria. This indicates that it is not the blood content of the medium which is the cause of the hemolytic property of bacteria.

#### DYSTOCIA FOLLOWING PERINEORRHAPHY.

Pouliot<sup>15</sup> reports a case of dystocia due to suture of the levatores ani. The patient had had a forceps delivery and six months later underwent an operation for repair of the torn perineum. During the ensuing pregnancy the attending physician was struck by the thickness and firmness of the perineal body which at the time of labor proved too resistant for the normal expulsive forces, and "episiotomy" had to be performed. This result of perineoplasty, not very rare if suture of the levators is undertaken, should be carefully guarded against in young women who are likely to have children. "To wish to do better than Nature may be dangerous," and if the levators are approximated, their line of contact should be as nature provides.

#### COMPLETE TEAR OF THE PERINEUM.

Pozzilli<sup>16</sup> describes in minute detail a new operation for complete laceration of the perineum which he has practised for several years. The operation already described in outline. The first step is the operation of perineoplasty, consisting of freeing the rectum and levatores ani. An H-shaped incision is made, extending from the vagina and external labia to the perineal body laterally, to permit the removal of the perineal



very little traction, to the perineum or to the newly constructed anus. A flap is thus turned down over the anus and the structures laterally including the levators are approximated in the median line. The operation is not new, but the excellence of Pozzi's description and the clearness of the illustrations deserve attention.

#### LEUCORRHEA.

Zweifel<sup>17</sup> describes at some length the treatment of leucorrhœa. After reviewing a few of the older procedures, he calls particular attention to some of the more recent methods of treatment, mentioning the dry method, the use of yeast preparations, sugar and lactic acid. *Bolus alba* (kaolin) is introduced as a powder and gives immediate beneficial results, but soon after treatment ceases, there is a recurrence. Of the yeast preparations, Zweifel gives no description, as he has had no personal experience with them.

Following the suggestion of Kuhn, Zweifel has employed sugar in fifty per cent. solution, introduced on a tampon and left for twenty-four hours. The patient then uses a douche at night on going to bed. The patient is instructed to put two teaspoonfuls of sugar in the irrigator, and two teaspoonfuls of very hot water on the sugar. The solution is then cooled and introduced into the vagina, after which the patient goes to bed. The treatment is continued at home for eight or ten days after which the patient returns for consultation.

Of sixty-six cases so treated, two-thirds came back and these showed very satisfactory results. A few, however, were resistant, and formalin was applied to the cervical canal. In the cases still resistant, lactic acid in solution of one-half of one per cent. was employed. If this strength gives burning or irritation, it may be diluted. This general line of treatment gave satisfactory results, and as the patients were kept under observation for some time, the beneficial permanent effects were determined.

#### URINARY INCONTINENCE.

Newman<sup>18</sup> describes an operation for urinary incontinence due to incompetence of the sphincter of the bladder which he has devised, and has been using for a number of years. It resembles somewhat an operation described by Kelly, but differs from that in its main object. Newman uses a knobbed bougie in the bladder drawn against the internal meatus to determine the position of the neck of the bladder. He then makes a lozenge shaped denudation of the vaginal mucous membrane, an inch and a half or two inches in length with its widest part, about three-fourths of an inch, over the bulb of the bougie. The tissue is then approximated from side to side, with interrupted or Lembert mattress sutures, which push in the tissues lying in the median line. Over this the vaginal tissue is closed to give further support. New-

man says the object of the operation is to bunch up the mucous membrane inside the internal meatus, thus blocking the passage of the urine and giving control. Undoubtedly there is some shortening of the sphincter of the bladder also.

#### BLADDER FUNCTION AFTER CONFINEMENT.

The question of why catheterization is necessary in the puerperium and especially after operation, has not been answered satisfactorily for all cases. But certain factors seem clear, and Taussig<sup>19</sup> analyzes the histories of one hundred and fifty-seven puerperal, and four hundred and five post-operative (non-puerperal) cases. Among the interesting points which he brings out in his discussion are first, the influence of the form of anesthesia, comparing fifty-eight cases operated on under spinal anesthesia and fifty-eight cases operated on under ether, all voiding spontaneously. In the former group, ten and one-half hours was the average time for the first voiding, in the second group, twelve hours. It was noted also that some cases voided spontaneously, but were not able to empty the bladder, so that catheterization became necessary after several days.

Taussig favors the retention catheter for post-operative paralysis, (cancer of the cervix), but relies on the ordinary form of rubber catheter kept in place by adhesive plaster. Certain objections to the mushroom retention catheter are thus obviated.

In regard to infection, Taussig holds that the danger of infection lies less in the technique or frequency of catheterization, than in the presence of stagnating urine in the bladder. Therefore, prophylactic treatment should be continued until the bladder fully empties itself. As a harmless, but, under certain conditions, effective stimulant to the bladder Taussig has used air injected by means of an air tight syringe. In the few cases in which it has been used, it was successful ten out of eleven times. Other methods of stimulating the bladder have been recommended, of which pituitrin is sometimes efficacious and boroglyceride seems to do more harm than good, according to Taussig.

#### COLON INFECTION IN THE KIDNEY.

Furniss<sup>20</sup> discusses colon bacillus infections of the kidney and attempts to formulate answers to the following questions: (1) Why are the urinary organs so susceptible to the colon bacillus? (2) What are the factors predisposing to infection? (3) What is the exciting cause? (4) How does it gain entrance? (5) What is the natural course of the infection? (6) What offers the best means of eradicating the infection?

The answer to the first question is not easy. Furniss says "at no time have the urinary organs been the natural habitat of the colon bacillus." The predisposing factors are interference with function, from obstruction to the flow



## THE POSSIBILITY OF NOVOCAINE ADDICTION.

WHETHER or not the Harrison law will ultimately prove effectual in abolishing, or at least minimizing, the evils of addiction to drugs, is dubious as yet. The intent of the law is good, but recent judicial decisions and interpretations have warned us that there are vulnerable places in it. Leaving out of the discussion for the moment opium and its derivatives, we have to consider cocaine, which would present an easier problem. In the first place there is not in the case of cocaine an addiction in the special sense we mean when we speak of morphine addiction. The devotees of the former drug get in the habit of taking the drug at intervals, these being regulated, in the lower class of users, by fluctuations of their personal finances, and in the higher class by circumstances of expediency. Following a cocaine debauch there is a true depression, but not the physiological craving for the drug which the opium habitué experiences. In the second place, cocaine has a more limited field in medicine than opium does, and it is not impossible that it may be replaced as a local anesthetic by other drugs, which do not possess among their properties the production of emotional exaltation.

Among the drugs which naturally occur to us in this connection is novocaine. This powerful anesthetic, like others of its class, ends in "caine," to indicate its physiological action as a local anesthetic, but is not chemically related to cocaine, being the hydrochloride of the organic base para-amino-benzoyl-diethylamino-ethane, a derivative of para-amino-benzoic acid, while cocaine is benzoyl methyl-ecgonine. It does not appear, from what scant information is available, that novocaine produces the psychic effects which cocaine does; however, a great deal more data must be obtained before any conclusions can be drawn as to this. If true it would seem that the substitution of novocaine for cocaine, wherever at all possible, would be indicated, so that the latter drug could be withdrawn from the market entirely. Before this is done the proper procedure would be to test out novocaine on a group of individuals of varying temperaments, to see whether or not it ever produces emotional reactions of a pleasurable nature.

## PROGRESS OF POLIOMYELITIS EPIDEMICS.

DURING the past week the epidemics of poliomyelitis in the United States have continued, on the whole, with steady abatement. In New York City on September 30 the number of cases reached a total of 3029 with 2286 deaths. In New York State, outside New York City, on the same date, the total number of cases amounted to 2592 with 580 deaths.

In New Jersey the total number of cases on September 19 amounted to 3376, and in Illinois on September 16, 563.

In Massachusetts on September 30, the number of cases during that month reached a total of 608 as compared with 390 during the first eight months of the year. The largest number of cases has been 282 in Boston and the next largest in Holyoke, where, on September 30, there had been a total of 69 cases. On September 28 the number of cases in Pittsfield, Mass., reached a total of 42.

On September 26, Mr. Roger Pierce announced the formation of a Harvard Infantile Paralysis Commission to conduct research into the transmission and treatment of the disease, and to constitute a clearing house for the collection and free distribution of therapeutic blood serum. Mr. Pierce's statement is as follows:

"A Commission consisting of Dr. Robert W. Lovett (Chairman), Professor of Orthopedic Surgery; Dr. Milton J. Rosenau, Professor of Preventive Medicine and Hygiene; Dr. Francis W. Peabody, Assistant Professor of Medicine, and Roger Pierce (Secretary), has been appointed by the Harvard Medical School for the purpose of assisting in the early recognition, treatment and study of infantile paralysis.

The Commission has undertaken this work in the endeavor to meet the increasing demands from physicians for assistance in making an early diagnosis, and for serum to be used in the treatment of the earliest stages of the disease. It is not at present definitely established that the use of serum is of benefit in the treatment of the disease. In the opinion of some physicians it is; however, the results thus far obtained justify the distribution to physicians for use of the serum they deem it advisable.

The serum is obtained from the blood of persons who have recovered from the disease. The Commission, however, is not at present of the opinion that persons may be vaccinated with the serum. It is obtained by allowing the blood of persons who have recovered from the disease to be taken. The serum is then prepared by a process of filtration and is distributed to physicians for use. All persons who have recovered from the disease are eligible for the serum. The Commission is not at present of the opinion that persons may be vaccinated with the serum.



School (Administration Building), Huntington Avenue, and make inquiry for the Harvard Infantile Paralysis Commission. If this is not convenient, an expert will visit the home for the purpose of collecting the blood serum.

Physicians, by telephoning to the Harvard Medical School (Brookline 2380) and inquiring for the Infantile Paralysis Commission, may obtain an expert at any hour of the day or night, who will visit a patient with the doctor to assist in the diagnosis of the case, and to administer serum if desired. The amount of serum available will depend upon the response of recovered patients to this appeal for volunteers. As the response cannot now be accurately estimated, the efforts of the Commission will, at the beginning, be confined to cases in or near Boston. Should it be found possible to extend the service, every attempt will be made to do so.

There will be close coöperation with the State Department of Health and local health authorities.

The serum and all services rendered by the Commission will be free of charge."

Within the first forty-eight hours there were ten responses to this call for serum volunteers. The Boston theatres have now been closed to children, but the public schools were duly opened on October 2.

Attention has been directed to a study of epidemic poliomyelitis as it has occurred in recent years in Sweden. The first extensive outbreak of the disease in that country occurred in 1905, when there were about 1500 cases. About the same number of cases were scattered through the succeeding quinquennium. In 1911, occurred the most serious visitation of the disease in Sweden, where, during the next three years there were 10,000 cases out of a population of 6,000,000. This epidemic had a mortality of 19.79%, and of the survivors, 7000 were permanently disabled. Since 1913 poliomyelitis has remained endemic in Sweden. Wernstedt of Malmö, one of the leading Swedish authorities on poliomyelitis, working with Kling and Peterson, found that the secretions of the mucous membrane of the mouth contained virulent organisms of poliomyelitis 204 days after the onset of the disease. They, therefore, advise continued isolation of patients for a number of weeks after the disappearance of the acute symptoms. In the Swedish epidemics, maximum incidence of poliomyelitis has been at the age of two years.

## MEDICAL NOTES.

**IMPERIAL CANCER RESEARCH FUND.**—The fourteenth annual report of the Imperial Cancer Research Fund, under the direction of the Royal College of Physicians of London and the Royal College of Surgeons of England, has recently been issued, recording progress of the year ended July, 1916. The work of the laboratory, already restricted by the war, has, during the past year, lost the services of Dr. Tsurumi, who concluded his investigations on heterologous tumor immunity and left the laboratory at the end of October, 1915. The general conclusion which emerged from his investigations was that the hemolytic and hemagglutination reactions of the sera obtained by immunizing rabbits against mouse and rat tumors were those characteristic of the proteins of the mouse and rat. The complement fixation and precipitin reactions did not run parallel to the species serum reactions, but seemed rather to correspond to the histological characters of the growths used as antigens, showing a considerable independence of their origin.

**PREVALENCE OF MALARIA, PELLAGRA, SMALLPOX AND TYPHOID FEVER.**—The weekly report of the United States Public Health Service for September 15, 1916, states that during the month of July there were reported in Arkansas 810 cases of malaria, 75 of pellagra, 29 of smallpox, and 125 of typhoid fever. During the same period there were 133 cases of typhoid in West Virginia and 30 of smallpox in Colorado.

**CHOLERA IN JAPAN AND INDIA.**—The weekly bulletin of the United States Public Health Service for September 15, 1915, contains report of 1295 cases of Asiatic cholera in the Province of Anan, India, and of 353 cases at Osaka, Japan. There were 467 cases of bubonic plague at Rangoon, with 440 deaths.

**CHANGES IN COST OF DRUGS.**—Report from New York on September 20 describes various recent changes in the cost of drugs, chiefly in the direction of a reduced price for quinine and an increase in the cost of glycerin.

"Quinine has been reduced 10 cents an ounce by domestic manufacturers, who now quote 65 cents an ounce for bulk lots of the sulphate and 98 cents for the alkaloid. An irregular downward revision of all minor salts of quinine is also announced, cinchonine alkaloid being reduced to 25 cents and sulphate to 12 cents, while cinchonidine alkaloid was lowered to 95 cents, and this reduction came as a complete surprise to the drug trade, as manufacturers had long been holding the umbrella at 75 cents an ounce against an outside market price which has varied all the way from 60 to 75 cents an ounce. It is understood that the reduction in quinine was more or less in the nature of a speculative







two girls, weighing six pounds each, and a boy, weighing five pounds, twelve ounces. It is believed that this is the first instance of the delivery of triplets by this method. Official report of the case will be awaited with interest.

**RING SANATORIUM TRAINING SCHOOL.**—The annual graduation exercises of the Ring Sanatorium Training School were held recently at Arlington Heights, Mass. The principal address was delivered by Dr. E. W. Taylor of Boston. Other addresses were made by Dr. C. T. Warner of Marlboro and by Miss E. P. Davis of the State Board of Registration of Nurses. Diplomas were given to a class of thirteen pupil candidates.

**REDWOOD LIBRARY AND ATHENAEUM.**—The Committee appointed by the Directors of the Redwood Library and Athenaeum, of Newport, R. I., regarding the recent donation of books from the medical library of the late Dr. Rufus E. Darrah, would respectfully report:

That the thanks of the Library be gratefully returned to Mrs. Darrah for her gift of books from the medical library of her late husband;

That this contribution is the more to be appreciated, since the great change that medical literature and the practice of both medicine and surgery have undergone during the past half century has rendered the former works in this department chiefly useful as merely historical and as books of reference, while those of Dr. Darrah are alike of the recent time and in accordance with its advanced state of knowledge; and further,

That the Darrah gift is additionally to be valued from having been the companions and daily guides of a citizen of Newport who, besides his professional skill as a surgeon, was preëminent in his public relations to the city as educator and sanitarian, and ever zealous for the best welfare of Newport.

The Committee recommend that its report be formally adopted by the Directors, and that copies thereof be communicated to Mrs. Darrah, and through the lay and medical press to the many friends, in every field of life, of the late Dr. Darrah.

This report was presented at the special meeting of the Directors held on Tuesday, September 19, 1916, and was unanimously adopted.

ALFRED G. LANGLEY, *Secretary*.

## Miscellany.

### ANIMAL TRANSMISSION OF HUMAN DISEASES.

IN connection with the article by Dr. Mark Richardson in the issue of the JOURNAL for Sept. 21, suggesting the possibility of the transmission of poliomyelitis by the rat flea, it is of interest to note a paper read by Dr. David John David at the quarter centennial of the University of Chicago on June 6, 1916, and published in the issue of *Science* for September 8. This paper reviews and discusses certain relations of the lower animals to human disease, and conveniently tabulates as follows the diseases of man which are, or may be, transmitted by animals:

#### HUMAN DISEASES CARRIED.

##### 1. By the dog:

- Rabies.
- Foot and mouth disease.
- Helminthiasis.
- Fukes.
- Tapeworms (especially *Tania echinococcus*).
- Infantile splenomegaly (from dogs through fleas).
- Trypanosomiasis (*T. gambiense*).
- Mange.
- Fleas and ticks.
- Ringworm.
- Favus.

##### 2. By the cow:

- Tuberculosis.
- Actinomycosis.
- Anthrax.
- Cowpox.
- Tetanus (through vaccine).
- Foot and mouth disease.
- Septic sore throat.
- Rabies.
- Pus infections.
- Tenia saginata.
- Milk sickness.
- Paratyphoid fever.

##### 3. By the horse:

- Glanders.
- Rabies.
- Tetanus.
- Sporotrichosis.
- Anaphylaxis.
- Serum disease.
- Odor of horses.

##### 4. By swine:

- Trichiniasis.
- Tuberculosis.
- Anthrax.
- Cestodes (especially *T. solium*).
- Trematodes.

##### 5. By sheep:

- Anthrax.
- Tuberculosis.

##### 6. By goats:

- Malta fever.
- Tuberculosis.

##### 7. By the antelope:

- Sleeping sickness.

##### 8. By the cat:

- Rabies.
- Cestodes.
- Trematodes.
- Favus.
- Ringworm.



9. By rats:
  - Rat bite fever.
  - Bubonic plague (through fleas).
  - Trichiniasis (through hog to man).
10. By ground squirrels:
  - Bubonic plague.
11. By birds:
  - Psittacosis (from parrot).
12. By fish:
  - Tapeworms.
13. By arthropods, chiefly insects:
  - Mosquitoes:
    - Yellow fever.
    - Malarial fever.
    - Dengue fever.
    - Filariasis.
  - Fleas:
    - Bubonic plague.
    - Infantile splenomegaly.
  - Ticks and mites:
    - Rocky Mountain fever.
    - Relapsing fever (African).
    - Tick fever of Miana.
    - Japanese flood fever.
  - Lice:
    - Typhus fever.
    - Relapsing fever (*Spiracheta obermeieri*).
  - Bedbugs:
    - Kala azar.
  - Flies:
    - Sandfly fever.
    - Sleeping sickness (tse-tse fly).
    - Typhoid fever and other infections carried mechanically.
  - Crustaceans (water flea):
    - Guinea worm infection (dracunculosis).
  - Oysters, clams, etc.:
    - Typhoid fever.
  - Snails:
    - Trematode infections (especially bilharziosis).

The author further summarizes the methods by which infected agents may be transmitted through or by animals, and calls attention to certain points which may be of importance in the control of such diseases. The article is commended to the attention of physicians interested in the relation of animals to disease.

## UNITED STATES DEATH RATES IN 1915.

On September 19 the director of the Census Bureau of the United States Department of Commerce issued a preliminary statement of the population, deaths and death rates in the registration area of this country in 1915, with comparative rates for earlier years. This statement shows a total death rate in this area of 13.5 per thousand estimated population,—the lowest rate hitherto recorded in the United States. This rate was based on 909,155 deaths returned from 25 states (in one of which, North Carolina, only municipalities of 1000 population and over in 1910 were included), the District of Columbia, and 41 cities in non-registration states, the total population of this area in 1915 being estimated at 67,337,000, or 67.1% of the total estimated population of the United States.

"There is a widespread and increasing interest

throughout the country in respect to vital statistics. The states of North and South Carolina, which recently enacted the "model law" for the registration of births and deaths, were admitted to the death-registration area for 1916, increasing the estimated population of the area to 70.2% of the total for the United States in that year.

The death rate for 1915, 13.5 per 1000 population, is the lowest ever recorded, the most favorable year prior to 1915 having been 1914, for which the rate was 13.6. It is markedly lower than the average rate for the five-year period 1901 to 1905, which was 16.2. The decrease thus amounts to 16.7%, or almost exactly one-sixth, during a little more than a decade. When due allowance is made for the addition of many new states to the registration area between 1905 and 1915, and the comparison is confined to the group of registration states as constituted during the period 1901-05—the present population of which is about one-fourth of the total for the country—there is still shown a very considerable decrease, from 15.9 to 14.3 per 1000 population, or 10.1%. This decrease, on the basis of the present population, would amount to 42,876 deaths. On the assumption that a corresponding reduction has taken place through the entire country, this would indicate a saving of approximately 170,000 lives in 1915 for the United States as a whole.

The annual report for 1915, to be issued later, will state that changes in the age and sex constitution of the population must be considered before the exact nature and extent of the lower general mortality can be understood. It is certain, however, that the great progress made during recent years in the sciences of medicine and sanitation, together with the widespread awakening of the people throughout the United States to the support of public health authorities, has resulted in the saving annually of scores of thousands of lives that would have been lost under the conditions prevailing only a few years ago.

An accompanying table shows the death rates for the past three years separately and for the consecutive quinquennial years, 1901-1905 and 1906-1910.

The areas to which the figures relate are the registration states and the cities which had 100,000 or more inhabitants in 1910. Separate figures are given for the colored population in states in which colored persons constituted 10% or more of the total population in 1910, and in cities having 10,000 or more colored inhabitants in that year.

In the states for which death rates for 1901-1905 are given, the greatest proportional decrease between that period and 1915 is shown for Rhode Island, 16.9%. Next in order are New York, with a decrease of 14.6%; New Jersey, 14.3%; Massachusetts, 12.7%; Vermont, 9.3%; Connecticut, 5.1%; Indiana, 3.8%; New



Hampshire, 3%; and Maine, 1.9%. Michigan alone showed a slight increase, eight tenths of 1%.

Among the cities having 100,000 or more inhabitants in 1910 the tendency is toward a still greater reduction in mortality. The following-named cities show, for 1915, decreases of 20% or more, as compared with the 5-year period 1901-1915: Newark, N. J., 29.9%; Atlanta, 28.4%; New York City, 26.8%; Los Angeles, 25%; Jersey City, 24.9%; Pittsburgh, 23.9%; St. Louis, 22.9%; Denver, 22.7%; Providence, 22.3%; Paterson, 21.9%; San Francisco, 21.7%; Fall River, 21.7%; Louisville, 21.1%; and Nashville, 20%.

It should be borne in mind that the rates here given are "crude" rates, which make no allowance for differences in the sex and age distribution of the population, and that, furthermore, the rates for certain localities are materially affected by deaths of non-residents who are attracted to those localities by their favorable climate or by their superior hospital facilities. Inferences in regard to the relative healthfulness of different states and cities should not, therefore, be drawn without more thorough investigation.



#### THE STORY OF THE DAACK FAMILY: A STUDY IN DYSGENICS.

In a recently published bulletin (No. 15) of the Eugenics Record Office, Anna Wendt Finlayson, field worker of the Warren (Pa.) State Hospital, records, with a preface by Charles B. Davenport, a "study in hereditary lack of emotional control," based on the history of the Daack family in that State. As a study in dysgenics, this account suggests and deserves careful comparison with the well-known Jukes. The story of the Daack family has recently been summarized in the daily press from this bulletin as follows:—

"In 1815 William and Mary Daack and their young son, Samuel, came from Ireland and settled in Western Pennsylvania. William was a peculiar, silly old fellow who drank a good deal, stole sheep and other valuables. Mary, his wife and also his cousin, was ignorant, quarrelsome, and would become angry at her husband and leave him for days at a time.

"This pair proved a bad investment for the United States and particularly for Pennsylvania. Mrs. Finlayson, investigating for the Warren State Hospital, got track of 754 names of descendants or persons who married descendants. Taking out all persons dying at less than 20 years of age, all persons marrying into the family and all who moved away and were entirely lost track of, Mrs. Finlayson had left 153 descendants of William and Mary concerning

whom she was able to secure fairly complete data.

"Of the lot no one was a distinctly good citizen or a force for good in the community. Forty, although mostly of a low order of intelligence, are capable of controlling their emotions and have not been a burden on society.

"In the second group are 72 individuals. The members of this group show various evidences of degeneracy, such as shiftlessness, illiteracy, lack of average judgment, sexual irregularity, heavy drinking, quick and violent tempers and inability to control their emotions.

"In the third group are 41 individuals. Some of these have been in insane asylums, some in penitentiaries, some in jails, and some in poor-houses. Most of the insane have had some form of emotional insanity. They are quarrelsome, quick tempered, violent and given to sulking. The disposition to leave their marital mates is very marked.

"Twenty-five were insane, 20 are described as lazy and shiftless, 39 are below the average of intelligence and 34 are described as ugly and quarrelsome. Thirty were alcoholics, 27 were notoriously sexually irregular, 18 had a habit of leaving their husbands or wives, as the case was.

"Of the nine children of William and Mary, Jane and Curtis founded the two worst family trees. Jane married her cousin, a bad man. Curtis married a defective woman from defective stock. The traceable cost to the State for caring for worthless descendants of this pair is \$28,354. The actual cost to society has been infinitely greater than that. There is no way of knowing the cost to the State or the value to the State of the members of the family who have moved far away."



#### Society Report.

##### FIRST LEGISLATIVE CONVENTION OF MASSACHUSETTS PHYSICIANS.

Worcester, Mass., Sept. 20, 1916.

The convention was called to order at 11 a.m., by Dr. M. A. Tighe of Lowell, chairman of Middlesex North District Committee. As temporary chairman he reviewed the history of the movement to interest the medical men of the State in an effort to have the Workmen's Compensation Act amended so that it would be fairer to the physicians throughout the State.

He appointed as a Committee on Credentials: Dr. G. Forrest Marten of the Massachusetts Homeopathic Society.

Dr. S. A. Mahoney, of Hampden District.

Dr. J. A. Mehan, of Middlesex North District.

This committee, during a short recess, examined the credentials of those in attendance. After the recess the committee reported that forty men, representing fifteen of the district societies and the Massachusetts Homeopathic Society, were present. Report was accepted.

It was voted that officers of the convention consist



of chairman, vice-chairman, secretary and treasurer. Election was by ballot, and resulted as follows:

Chairman, Dr. William H. Merrill, of Essex North.  
Vice-Chairman, Dr. George O. Ward, of Worcester.  
Secretary, Dr. Joseph A. Mehan, of Middlesex North.

Treasurer, Dr. Ernest L. Hunt, of Worcester.

On motion of Dr. C. J. Burgess of Essex North it was voted that the name of the convention be, "The First Legislative Convention of Massachusetts Physicians."

It was moved by Dr. M. A. Tighe, of Middlesex North, that it is the sense of this convention that the Workmen's Compensation Act is unfair to the physicians of Massachusetts, and should be amended so as to give the injured workman the right to select his physician.

An amendment was offered by Dr. Mehan of Middlesex North, that the words "without sacrificing any of the benefits of the Act" be added.

Another amendment was offered by Dr. W. T. Hopkins of Essex South, that the words "workmen and" be inserted, so that the motion would read in part "unfair to the workmen and physicians."

A further amendment was offered by Dr. J. B. Howland of Suffolk that the words "or hospital" be inserted after the word physician so as to read in part "to select his physician or hospital."

The motion was freely discussed, and on motion tabled.

It was later voted to refer the motion as tabled to a committee of three, nominated from the floor, they to arrange a motion in accordance with the original and the amendments offered.

The Committee selected consisted of Drs. M. A. Tighe of Middlesex North, F. J. Cotton of Suffolk, and M. J. Cronin of Norfolk. They retired, and on returning presented the following resolution, which was unanimously adopted:

That it is the sense of this convention that the Workmen's Compensation Act is unfair to the workmen and physicians of Massachusetts, and should be amended so as to give the injured workman the right to select his physician, surgeon, hospital, or all three without sacrificing any of the benefits accruing to him under the Act. Furthermore, the Association should be responsible for the expense of medical and surgical and hospital care during the first two weeks after injury, and, if the employee is not immediately incapacitated thereby, from earning full wages, then from the time of such incapacity and in unusual cases—in the discretion of the board for a longer period.

The subject of health insurance was introduced by Dr. T. F. Greene of Norfolk and discussed by Drs. R. M. Merrick, F. J. Cotton and W. W. Walcott. The subject is of great importance to our men, but it was felt that we should not take a definite stand on the matter at this time because the convention had been called for the specific purpose of discussing the Workmen's Compensation Act.

Recess for lunch was taken from 1.30 to 2.15 p.m.

A motion was offered that the convention as organized be a permanent body. Following discussion, the motion was tabled.

It was voted on motion of Dr. I. J. Clark of Essex North that the organization of this convention and all of its actions be reported to the several societies for their endorsement or rejection, and that its permanency be entirely dependent upon their action.

On motion it was voted that when the convention adjourns it be to the call of the chair and officers.

It was voted on motion of Dr. F. B. Pierce of Essex North that a committee of one delegate from each district delegation and one from the Massachusetts Homeopathic Society be appointed and constitute a Central Committee, to be given full power to proceed in carrying out the recommendations of the convention.

It was also voted that each district delegation elect its member to the Central Committee, and a recess was taken for such election.

On motion of Dr. A. W. Marsh of Worcester it was voted that the quota of the Massachusetts Homeopathic Society on the Central Committee be three instead of one.

On motion of Dr. A. H. Quessey of Worcester North it was voted that the secretary of the convention be added to the Central Committee and act as its secretary.

The question of raising funds to carry on the work was discussed, and the method of raising them left to the Central Committee.

The Central Committee as elected is as follows:

Barnstable, J. P. Nickerson.

\*Berkshire

†Bristol North

\*Bristol South

Essex North, W. H. Merrill.

Essex South, W. T. Hopkins.

\*Franklin

Hampden, S. A. Mahoney.

Middlesex North, M. A. Tighe; J. A. Mehan, Sec.

Middlesex South, W. W. Walcott

\*Middlesex East

Norfolk, R. M. Merrick.

Norfolk South, N. S. Hunting.

\*Plymouth

Suffolk, R. M. Green.

Worcester North, A. H. Quessey.

Worcester, E. L. Hunt.

Mass. Homeopathic Soc., G. Forrest Marten, E. A. Fisher.

A rising vote of thanks was extended to the committee from Middlesex North "for taking the initiative in this work and organizing the convention."

It was voted that the treasurer of the Central Committee pay expenses incurred today by the convention.

At 4.20 o'clock it was voted to adjourn.

Sixty representatives were present during the convention. The greatest number of these present at any one time was fifty-one, and the least number at any time twenty-nine.

The above report is somewhat condensed, but is an accurate statement of the work of the convention.

Attest:

JOSEPH A. MEHAN,  
Secretary

#### CHANGES IN THE MEDICAL CORPS, U. S. NAVY, FOR THE TWO WEEKS ENDING SEPTEMBER 23, 1916.

September 9.

P. A. Surgeon G. W. Shepard, to Receiving Ship, Norfolk, Va., Sept. 25, 1916.

Asst. Surgeon W. M. Drum, M.R.C., appointed from August 25, 1916.

P. A. Surgeon M. A. Stuart, to Navy Yard, Norfolk, Va., Sept. 25, 1916.

P. A. Surgeon J. A. Ballo, from N. Y. Recruiting Station, to Naval Hospital, Portsmouth, N. H.

Asst. Surgeon V. H. Carson, detached to Marine Expeditionary Force, San Domingo, to Cuba.

Asst. Surgeon J. T. Bonds, detached to Marine Hospital, Port-au-Prince, Haiti, to the Haitian Constabulary.

Asst. Surgeon J. B. H. to the Haitian Constabulary.

Surgeon J. C. Pryor, detached to the U. S. Marine and Surgery to Navy, Marine Hospital, Port-au-Prince, Haiti.

Surgeon I. N. Kelly, detached to the U. S. Marine Hospital, Port-au-Prince, Haiti.

Surgeon I. N. Kelly, detached to the U. S. Marine Hospital, Port-au-Prince, Haiti.



P. A. Surgeon John Buckley, commissioned from February 4, 1916.  
Asst. Surgeon J. C. Rushmore, commissioned from August 10, 1916.  
Asst. Surgeon Gordon Gibson, commissioned from August 10, 1916.  
Asst. Surgeon C. H. Francis, commissioned from August 10, 1916.

September 11.

Medical Inspector N. J. Blackwood, detached Navy Yard, Boston, Mass., to command *Solace*.  
Medical Inspector R. M. Kennedy, detached *Solace* to home, wait orders.  
Surgeon J. F. Leys, to Navy Yard, Boston, Mass.

September 13.

Surgeon Karl Ohnesorg, detached Asst. Naval Attaché, Berlin, Germany, to leave of absence.

September 18.

Medical Director J. D. Gatewood, detached command Naval Medical School, Washington, D. C., to Bureau of Medicine and Surgery, Navy Department.

Medical Director E. R. Stitt, to command Naval Medical School, Washington, D. C., September 25, 1916.

Medical Inspector R. M. Kennedy, to command Naval Hospital, Washington, D. C.

Acting Asst. Surgeon Dunn, to Marine Recruiting Station, Atlanta, Ga.

September 19.

Surgeon J. S. Taylor, detached *Alabama* to Force Surgeon Reserve Force, Atlantic Fleet, on *Rhode Island*.

Surgeon H. C. Curl, detached Force Surgeon, Atlantic Fleet, to Marine Barracks, Port Royal, S. C.

P. A. Surgeon G. B. Trible, to Naval Academy, Annapolis, Md., September 25, 1916.

September 20.

Surgeon H. F. Strine, to Naval Hospital and Medical School, Washington, D. C., September 25, 1916.

Surgeon R. W. Plummer, to the *Alabama*.

Surgeon G. F. Freeman, detached *Tacoma* to home, wait orders.

P. A. Surgeon H. A. May, detached Marine Barracks, Port Royal, S. C., to home and wait orders.

P. A. Surgeon P. E. Garrison, detached *Dolphin* to Expeditionary Force, San Domingo.

P. A. Surgeon E. H. H. Old, detached Naval Medical School, and Naval Hospital, Washington, D. C., to *Solace*.

P. A. Surgeon D. G. Sutton, from *Chester* to Naval Medical School.

P. A. Surgeon D. G. Allen, to the *Chester*.

The following Assistant Surgeons, M.R.C., have been ordered to the Naval Medical School, Washington, D. C., September 25, 1916, for course of instruction:

L. H. Williams, F. F. Murdock, O. D. King, A. C. Stinton, C. H. Francis, J. J. Laughlin, J. A. Halpin, E. E. Cox, A. W. Hoagland, A. M. Larsen, F. T. Weaver, I. W. Jacobs, A. H. Cechia, P. F. Prioleau, J. C. Brentley.

#### SOCIETY NOTICES.

THE MASSACHUSETTS THERAPEUTIC MASSAGE ASSOCIATION.—The next meeting will be held at the Hotel Brunswick, at 8.15 p.m., Thursday, October 12.

Dr. Hale Powers, assistant physician in nervous diseases at the Boston City Hospital, will address the Society on "Why Massage is Indicated in Epilepsy." Members of the medical profession invited.

DOUGLAS GRAHAM, M.D., President,  
Hotel Brunswick,  
MRS. MABEL F. WALKER, Secretary,  
115 Cedar Street, Malden, Mass.

NORFOLK SOUTH DISTRICT MEDICAL SOCIETY.—Meeting for Medical Improvement at United States Hotel, Boston, Thursday, October 5, 1916, at 11.30 A.M.

Reader: William H. Gilpatrick, D.M.D., of Boston.  
Subject: "Dental Radiography and Its Relation to Medicine." Illustrated with case histories. Stereopticon.

For Charles S. Adams, M.D., of Wollaston.

Other subjects which may be discussed are Physicians' Liability Insurance and "Workmen's Compensation Act." A full attendance desired.

F. H. MERRIAM, M.D., Secretary,  
South Braintree, Mass.

#### RECENT DEATHS.

DR. STEPHEN WENDELL ABBOTT died at a private hospital in Lawrence, September 1, 1916. He was a graduate of the Medical Department of New York University in 1879, joined the Massachusetts Medical Society in 1880, and had practised in Lawrence since that time, being retired from practice for several years. Formerly he was a member of the American Medical Association. He was for many years visiting physician to the Lawrence General Hospital and a member of the Lawrence Medical Club. He is survived by his widow, one daughter and one son.

DR. ENRIQUE NUÑEZ PALOMINA, secretary of sanitation in the national policies of the island of Cuba, and a prominent figure in public life, died at a hospital in New York, on September 15, after undergoing two operations for an infection resulting from a cut. His case was aggravated by diabetes.

Dr. Nuñez went to New York several weeks ago to investigate the methods being used to check the epidemic of infantile paralysis, because of the prevalence of that disease in Cuba, and also to visit curative springs in this country.

Dr. Nuñez was born at Madruga, Havana province, on January 16, 1872. He was graduated from the University of Havana in 1886, and as a surgeon in 1893. Afterward he became professor of medicine at the university. He was appointed secretary of public health on April 23, 1913, but resigned on June 15 of the same year.

Reappointed to the cabinet, he resigned again in 1914. Later, he reentered the Government service as secretary of sanitation and was considered an expert in sanitation and preventive medicine.

DR. EUGENE P. STONE, U.S.N., retired, who died recently at North Sutton, N. H., was a native of Boston. He was graduated from Harvard Medical School in the class of 1886, and entered the navy.

During his early life he saw considerable of army activities with his father, and had a part in the campaign against the Mute Indians. Dr. Stone served in Alaska for a long time, and at one time was attached to the President's yacht *Mayflower*. He was with the fleet which made the cruise around the world during the Roosevelt administration, and for some time was attached to the naval station at Annapolis. He was for two and one-half years in charge of the medical department at the Charlestown Navy Yard, but in 1911 was ordered to proceed to the Philippines to command the medical department of the navy there.

He was obliged to resign this post in a short time on account of failing health, and he then retired from the navy. He spent two years in Colorado, hoping to regain his health, and the past two winters he passed in Florida.

He is survived by his widow and by two sons.



The Boston Medical and Surgical Journal

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WERE THE SAILORS OF COLUMBUS THE  
FIRST EUROPEAN SYPHILITICS?

By ANDREW F. DOWNING, M.D., CAMBRIDGE, MASS.

THE theory of the American origin of syphilis was first advanced four centuries ago. I use the term "theory" notwithstanding the opinions of those who are convinced that Iwan Bloch has given us conclusive proof. Today it is not unusual to read, in our medical journals, the unqualified statements of American physicians that syphilis was introduced into Europe by the returning sailors of Columbus; and even the laity are frequently heard to express the same opinion. From an American point of view, the discovery of this continent by the Italian, Christopher Columbus, is the most important as well as the most romantic event in the history of the world. Therefore, no American physician with a sense of pride or justice ought to be willing to admit, if it cannot be absolutely proved, that the price of the discovery of this new world in which he lives was that frightful epidemic of syphilis that devastated Europe during the last few years of the fifteenth and the beginning of the sixteenth centuries. To smear romance with the melancholy of venereal disease may delight the perverted mind of the unsentimental iconoclast; but to allow him to teach a rising generation, already wise in its knowledge of the social evil, to associate a loathsome disease with a great historic event, is to condone an unpardonable insult to the memory of Christopher C.

## BIBLIOTHECA UNIVERSITATIS

### A TIMELY HINT FOR DEATH INSURANCE

## BOOKS REVIEWED

The Methods of a Physician. Francis & Taylor.  
The Practical Medical Series. 1. Diseases of the  
Infections of the Blood. By A. C. B. 1890.

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lunibus. It is the purpose of this paper to analyze, in the light of actual historical evidence, the principal arguments that are supposed to prove the American origin of syphilis.

To avoid confusion, all discussion of other theories is waived, and I shall consider the story of the beginning of syphilis only as it may or may not relate to the actual known facts of the discovery of America by Columbus.

On August 3, 1492, Columbus set sail from Palos, Spain, with three vessels and a crew of about ninety men. An alien with a Spanish crew, if we except an Irishman from Galway, a converted Jew, and an Englishman, he was facing a difficult task as he headed his ships into the "Sea of Darkness." His largest and only decked vessel was the Santa Maria, of about one hundred tons burden, the length of which has been estimated at from seventy-five to ninety feet. The two other vessels were the Pinta and the Niña, both undecked, the lengths of which have been estimated as fifty and forty feet, respectively. The crew of the Santa Maria, including Columbus and the officers, numbered about fifty-four men; that of the Pinta eighty, and the same was true of the Niña. On October 12, 1492, he landed on the island of San Salvador, and after a short stay there, he sailed around among the islands, eventually returning to his base, San Salvador, on October 28. On November 20 he was defeated by the Indians, and the command of the Pinta was given to the Niña. On December 6, 1492, Columbus returned to the mainland, the Niña, and the Santa Maria, and on January 1, 1493, the Santa Maria was wrecked at the foot of



Fiske remarks, "His armament was now reduced to the little undecked Niña alone, such a craft as we should deem about fit for a summer cruise in Long Island Sound."

For the purpose of reckoning a possible time of infection, it is important to notice the date of the arrival in Hayti, because this island is supposed to be the home of syphilis according to those who advance its American origin. It is probable, too, that the Pinta, before she again joined Columbus, spent most of her time here also, and therefore the approximate date of exposure of her crew would correspond to that of the crews of the other two vessels.

Having now only the little Niña, Columbus was obliged to leave at Hayti a colony of thirty-nine men, at a place called Navidad in honor of the Feast of the Nativity, on which day the Santa Maria was wrecked. This little group now falls out of our story, because, on his return about a year later, Columbus found them annihilated, murdered probably by the natives. They surely played no part in the origin of European syphilis. On January 4, 1493, he set sail for Spain, and two days later, on the northern coast of Hayti, came up with the Pinta, whose commander had been delayed trading with the natives and searching for gold.

In the two vessels there were about fifty men, exclusive of the ten Indians that were being carried back to Spain. From February 12 to 16, they encountered such a terrible storm in mid ocean that they gave themselves up for lost. During the storm, the vessels became separated, not to meet again until they were anchored in the harbor of Palos. "Those who have seen a gale of wind with a heavy sea in the latitude of the Azores," says Clements Markham, "can imagine the critical position of a leaky little boat of forty tons like the Niña, rising on the top of a huge Atlantic wave, then plunging into the trough, with the mountainous billows foaming around higher than her mast-head, then rising and plunging down again, the slightest inattention to the helm making destruction certain, while green seas washed over her fore and aft." There must have been at least a few of the twenty-five men aboard able to devote to their own safety an almost superhuman effort. On March 15, 1493, the Niña reached Palos, and Martin Pinzon with the Pinta, on the evening of the same day, also put into the harbor. A few days before, he had arrived at the harbor of Bayonne in Galicia.

As far as we know from the records, and they are quite full, every member of the crews of both vessels was alive and well. One Indian had died on the very day that the Niña arrived, and three others were too ill to travel farther than Palos. No champion of the American origin of syphilis has tried to prove that the death or the sickness was due to syphilis. In the letter of Columbus, written in February, 1493, and dated on board the Niña, there is no mention or suggestion of any strange disease. There was on

the Niña a physician, Maestro Alonzo of Moguer, who would undoubtedly have reported to Columbus the presence of any new malady among the sailors. If these men were infected in Hayti, there was ample time for some symptoms to appear while they were still on the ocean. The voyage home in those open boats in rough weather, under sanitary conditions that must have been appalling, ought to have been marked, in a few cases at least, by symptoms of early syphilis, which in that day was almost malignant, and frightful even in its initial stage.

Fracastor's description is of a disease that would not have escaped attention. "Animum tristitia quaedam detinebat," he says. Depressed spirits, pallor, lassitude, foul ulcers of the genitals, sores on the lips, tonsils, and nose; terrible pains in the joints, bones, muscles, and nerves; emaciation, no desire for food, swelling of the legs and face, loss of hair, fever and prostration (*amor decubitus*)—these were common and even early symptoms in that first epidemic. Perhaps sufficient time had not elapsed to produce any secondary symptoms, but it seems impossible to believe that if there were infected men in either the Pinta or the Niña, they could have escaped the notice of their companions. The gossip of the sailors about a new venereal disease would have excited the curiosity of the people quite as much as the appearance of the Indians. These men had weathered a severe storm; they were exposed to cold and wet, and were in want of food; and yet they brought their vessels safe to port,—a feat that could hardly have been accomplished if *amor decubitus* had been the rule.

From Palos, Columbus went overland to Seville, which he entered triumphantly on Palm Sunday, 1493. He was accompanied by Juan Niño, master and part owner of the Niña, by the pilots and several seamen, and by six Indians. In that crowd of spectators was Las Casas, destined to be one of the great men of the world, and the most trustworthy historian of Columbus. He was then but twenty years of age.

After spending several weeks in this city, Columbus was summoned to attend court in Barcelona, where he arrived, after making the journey by land, about the middle of April. In the parade around the city we are told that he was preceded by the Indians and by sailors of the Niña. It will be remembered that Martin Pinzon deserted him with the Pinta and received a cold welcome when he arrived at Palos. Pinzon, who was then about fifty years of age, died three days after his arrival. His crushing reproof from the Spanish court, forbidding him to appear in the presence of the sovereigns, is supposed to have hastened his end. There is no mention of the sailors of the Pinta, and it may be that on account of the desertion of their master and his subsequent death, they had no desire to accompany Columbus to Barcelona.

All these facts must be grasped in order that



we may get some estimate of the possible sources of infection in Barcelona. It is probable that not more than twenty-five of the sailors were present, and if most of them were infected they must have been in the midst of severe secondary symptoms. Yet of such conditions there is no trustworthy contemporary record, although Bloch cites that of Diaz de Isla, which I shall consider later. On May 28, 1493, Columbus left Barcelona and immediately began to prepare for his second voyage, on which he embarked at Cadiz, September 25, 1493, with seventeen vessels overcrowded with fifteen hundred men.

The physician on this voyage was Dr. Diego Alvarez Chanca of Seville, a man of high reputation for skill and learning. He was ordered to join the expedition, not only to take medical charge, but also to report upon the rare and unknown plants of the Indies. Evidently he was a man of more than ordinary education. In a letter to Spain in the latter part of 1493, he makes no mention of any new diseases. This is also true of the letter of Columbus dated January, 1494. Of sickness there was plenty, but it was due to the hardships of the voyage, the salt provisions, the mouldy biscuits, the water, and the climate. "One-third of the people," says Chanca, "have fallen sick within the last four days, which I think has principally arisen from the toil and the privation of the journey. Another cause has been the variability of the climate." The letter of Columbus mentioned above confirms this statement. Moreover, although the journal of the second voyage of Columbus is lost, much information concerning it was given to Bernaldez by Chanca. Besides, on his return from the second voyage, Columbus stayed at the house of Bernaldez, who thus heard the story of that voyage from the Admiral himself, while it was still fresh in his mind. Columbus also left with him written memoranda which Bernaldez used in his *Historia de los Reyes Catolicos*, which is considered the highest authority on this particular voyage. In it we can find no mention of this new disease, although the author was in possession of many facts that he obtained from Chanca.

On the 2d of February, 1494, Antonio Torres, in command of nine of the vessels, sailed on the return voyage to Spain. In July, 1494, Margerite, one of Columbus's lieutenants, deserted his post, and seizing three vessels sailed away to Spain with a number of other deserters. This man had been in command of a fort in Hayti, where his rule was characterized by idleness, robbery and the outraging of women. These events put back in Spain in 1494 a part of that second expedition. In June, 1496, Columbus himself returned with two vessels overloaded with more than two hundred homesick passengers, a haggard and starving company.

The story of Columbus for the present purpose need be pursued no further, but these historical facts seem to be necessary in order to

show the impossibility of adjusting to them the evidence on which Iwan Bloch rests his case. Here it will be well to ponder over the words of John Fiske, who says, in speaking of historical blunders that arise from things that are spoken: "In order to arrive at historical truth, it is not enough to obtain correct pieces of facts; it is necessary to group the items in their causal relation and to estimate the precise weight that must be accorded to each in the total result. To do this is so often difficult that half truths are very commonly offered in place of whole truths, and it sometimes happens that of all the forms of falsehood none is so misleading as the half truth."

The first main fact in the evidence is a letter of Peter Martyr, dated 1488, and addressed to Pedro Arias Barbossa, professor of Greek at Salamanca. Martyr was born in 1457 and died in 1526. His voluminous correspondence consists of eight hundred and thirty letters, which were assembled in 1530 by Aleida des Henaris and later, in 1670, re-edited at Amsterdam. In the letter referred to, Martyr mentions the *morbus galliens*. "*Ario Lusitano Græcæ Litteras Salutiæque Profitenti; Valentidenario. In peculiarem te nostræ tempestatis morbum, cui appellatione Hispana Bimarium dicitur, ab Italico morbus Gallienus, medicorum Elephantiam alii aliter appellant, incidisse præcipitum. Hæc ad me scribis pede.*" etc. "To Arias of Portugal, Professor of Greek at Salamanca, good health:—You write me freely that you have suddenly fallen into that peculiar disease of our own time which is called by the Spanish name Bimas, by the Italians, Morbus Gallienus, some doctors call it Elephantia, some other names." Bloch cites Von Ranke, Schumacher, and Bernays as proof that several of Martyr's letters are wrongly dated. Bernays points out that this letter in particular must bear the wrong date, because the history of the University of Salamanca shows that there was no chair in the Greek language until 1508. Now as long ago as 1823, Dominico Thiene, an opponent of the American origin of syphilis, mentions this same letter and refuses to accept it as evidence for the same reason. Our own historian, William H. Prescott, also an opponent of the American origin, remarks that Thiene does not cite his authority for limiting the introduction of Greek at Salamanca to 1508. Prescott states that it was probably Pedro Chacón, who in 1499 compiled the history of the University. The accuracy of his chronology, however, as we will be doubted from a cross-reference on the same page with the date referred to, when he speaks of Queen Isabella's crowning the Crown in 1512. Prescott also states that Barbossa was professor of Greek at Salamanca in 1488, and that he was a pupil of Andreas Recolletus. Andreas Recolletus, an draught of a physician, was a student of Luchina, professor of Greek at Madrid, and a professor at the University of Quito.



Barbosa, *Bibliotheca Lusitana*, tom 1, p. 77.) "Arias of Portugal, for forty years and more, taught at Salamanca with great credit not only the Latin language, but also the Greek." Barbosa died in his native Portugal in 1530, where he passed several years before his death, and therefore this letter places him at Salamanca at the time indicated by Martyr.

Furthermore, Rashdall states that Salamanca was one of the five universities at which the Council of Vienna in 1312 directed that "Professors of the Greek, Arabic, Chaldee and Hebrew languages should be maintained." This University was founded about 1230, and by the sixteenth century was one of the largest in Europe. The higher education of women had already begun there. It was from Salamanca that Queen Isabella summoned the brilliant Dona Beatrix Galindo to teach her Latin. Here also Dona Lucia de Medrano publicly lectured on the Latin language. The matriculation book in 1552 gives the names of 6328 students. It is indeed strange to find such a progressive institution lacking a chair in Greek before 1508, and it is an amusing fact to find that the argument in favor of the American origin of syphilis must be constructed on the absence of a Greek professorship at a great university. Even if we concede at the outset this one point to Bloch, we have at least shown that if Greek was not taught at Salamanca before 1508, Martyr's letter must have been written fifteen years or more after the discovery of America, and its author, had he heard of the American origin of syphilis, would undoubtedly have mentioned the fact together with the other terms which he used in commenting on the disease.

The evidence most emphasized by Bloch comes from a Portuguese physician, Ruy Diaz de Isla, who was born in 1462 and died in 1542. This physician is the author of two works published in 1539 and 1542, respectively. He is supposed to have been in Barcelona in 1493, where he witnessed the reception to Columbus on his return from the New World. Later he practised in Seville, and afterwards spent ten years as surgeon at the Hospital of All Saints, in Lisbon. Modesty was not one of his virtues. He wishes to impress us with his long experience. He says that he is convinced that syphilis came from the island discovered by Columbus, and that it is contagious in its own peculiar way. It was easily acquired and soon manifested itself in the fleet in the case of a pilot from Palos named Pinzon, and in others in whom the aforesaid disease was advancing. This statement, upon which Bloch lays so much stress, is taken from an edition of de Isla's, known as the *Codex*, which was first published between 1510 and 1520, and is supposed to have been discovered in the national library of Madrid by Montejo, a Spanish physician. Bloch tells us that he was born in 1825 and died in 1890. Montejo's first work on the history of syphilis appeared in 1857. The *Codex* is dedi-

cated to King Manuel of Portugal, who died in 1521. Prokseh remarks that the date 1510 is certainly erroneous because in this book an event of 1514 is mentioned. It was written then, not earlier than 1515, and this places it more than twenty years after the discovery of America. I cannot appreciate Bloch's enthusiastic remark that this important work is twenty years older than the edition of 1539.

In the *Codex* occurs the following passage: "Segun que por muy larga y cierta experiencia se ha hallado, y como esta ysla fue descubierta y hallada por El Almirante Don Cristoval Colon al presente teniendo platia y comunicacion en las yndias Como el de su propia calidad sea contagioso, facilmente se les apego. E luego fue visto en la propia armada *em hun piloto de Palos que se llamava Pincon* y en otros que el dicho mal fue prosiguiendo." (This is the passage that I have rather freely translated in the indirect quotation in the preceding paragraph.) Compare this with the passage taken from the edition known as "tractado Contra el Mal Serpentino," published in Seville in 1539: "Segun que por muy larga y cierta experiencia se ha hallado. E como esta ysla fue descubierta y hallada por el almirante don Xristpoual Colon, al presente teniendo platia y comunicacion con la gente d'lla. E como el de su propia calidad sea contagioso facilmente seles apego: y luego fue vista en la propia armada." It requires no knowledge of Spanish to see by mere inspection that these passages are almost identical except in the last line, in which Pinzon is definitely accused of being syphilitic.

One cannot help asking if the *Codex* is an edition that has been tampered with by inserting this accusation against a prominent member of the first crew of Columbus. If the *Codex* was really written by Diaz de Isla, did its author put it aside through fear of publishing it during the lifetime of Vincente Pinzon? Moreover, if it was published as early as 1515, when Pinzon was still living, why is it that we have no record either of Pinzon's own protest against it, or the protest of his family? Is it possible that the supporters of the American origin of syphilis, in order to strengthen their case, have deliberately made this charge? Almost a quarter of a century had elapsed since the date of the return of the Admiral from that first voyage, and yet no other writer had made any mention of the presence of the disease in that first crew.

Bloch praises de Isla as a skillful physician, with a deep knowledge of syphilis and its treatment, but he lacks a sense of humor when he tries to excuse the assertion of de Isla that syphilis in its pustular form attacks vegetables, especially the cabbage. In 1823 Thiene refused to accept the evidence of de Isla on the ground that Girtaner did not give his authority for the facts concerning the life of this physician. Furthermore, Thiene objected to the lack of the testimony of eye witnesses to support the statement of Bloch's authority concerning the pres-







long ago disproved. His first visit was in 1502, a date important to note, because by the time Las Casas arrived, syphilis was widely spread among the inhabitants of the new world. The passage which Bloch cites from this author is in the fifth volume of the *Historia*, which was written when Las Casas was at least eighty-five years of age, about sixty-five years after the discovery of America. A translation of that passage follows:—

"There were and still are in this island two things which in the beginning were very dangerous to the Spaniards. One is the sickness of Las Bubas, which in Italy is called the French disease. It is the truth, however, that it came from this island with the first Indians when the Admiral Christopher Columbus returned with the news of the discovery of the Indies. The Indians I saw afterwards in Seville, and they may have brought the disease into Spain either by infecting the air or in some other way; or it was brought by some Spaniards already infected, in the first return voyage to Seville. This could be from 1494 to 1496. Moreover, at this time King Charles of France passed into Italy with a great army, which became afflicted with this contagion. For this reason the Italians think that it was spread, by these soldiers, and from this time on they called it the French disease. I asked several times the Indians of this island if this disease was very old, and they replied that it was present there before the first Christians came. In fact, its origin was beyond their memory, and this no one ought to doubt.

"It appears, however, that Divine Providence has provided for it a special medicine which is, as I have stated above, the wood of the guaiac tree. It is especially noticeable that all the Spaniards who did not practise chastity were infected, and not one in a hundred escaped if the woman had the disease. The Indians, men and women, who have it are very little troubled by it, no more than if they had smallpox, but the Spaniards are painfully afflicted and are in great and continual torment, especially before the pox break out."

In the earlier chapters of the *Historia*, in which Las Casas shows such an intimate knowledge of the voyages of Columbus, he does not mention the disease in connection with the Indians or the members of the crew. Remember that he wrote the passage quoted above years afterwards, when he was undoubtedly influenced by the theory that the infection was brought from the Indies. His inquiries of the natives concerning syphilis cannot be given serious consideration, because neither he nor the natives knew enough about the disease to hold an intelligible conversation. Bloch himself characterizes as utterly worthless certain descriptions of and references to diseases of the genital organs by ancient and medieval authors that could easily be taken as indicating syphilis. Yet he does not consider that the Indians with

whom Las Casas talked may have had some other disease in mind, and that consequently their opinions are as utterly worthless as the descriptions of our ancient, but highly civilized and educated, authors. Las Casas arrived in the New World at a time when the disease had already been brought from Europe, and he must have been impressed by its malignancy in that first epidemic. Like Oviedo, he also observes that although Providence has inflicted this disease upon the natives of Hayti, divine justice has made some compensation by providing on the island a cure in the guaiac tree. I wonder what Las Casas would have thought had he known that the mercy of Providence was truly expressed in those ancient quicksilver mines in Almadén, in his native Spain, from which, for centuries before and after his time, the world derived its largest supply of the real cure for syphilis. Would he have thought that the pox was of Spanish origin, or would he have clung to his first belief and decided that this wonderful deposit of mercury in Almadén was intended for the ills of the poor heathen, to whom Columbus, under the patronage of Spain, was sent as an instrument of Divine Providence?

When he wrote this chapter, Las Casas evidently did not know the value of mercurial treatment. Moreover, Fracastorius, one of the few men of mighty intellect that have graced our profession, had refused already, at this time, to accept the theory of the American origin, and had written his poem, *Syphilis sive Morbus Gallicus*, which contains a vivid description of the treatment by mercurial inunctions. Had Las Casas been familiar with the discussions of the time concerning this disease, he would undoubtedly have given some thought to the opinion of the learned author of this poem. In that nineteenth chapter of the fifth volume of the *Historia*, he was simply expressing some random thoughts that should not be interpreted too literally. His work in the world was far more important than Bloch seems to realize. To reduce him to the rôle of an amateur syphilographer is as ridiculous as to cast the star in the rôle of one of the strolling players in Hamlet. The American physician who would know him intimately can find no more profitable task than the reading of the story of Las Casas and his brother Dominicans of that little monastery in Guatemala. "We cannot make him anything else," says John Fiske, "but an antagonist of human slavery in all its forms, and the mightiest and most effective antagonist that has ever lived. Subtract his glorious life from the history of the past, and we might still be waiting, sick with hope deferred, for a Wilberforce, a Garrison, or a Lincoln."

Although Bloch is always ready to quote Las Casas in support of his pet theory, he ignores that author's story of the first voyage of Columbus, which is recognized as authentic by every genuine historian. For instance, he gives the







can be found no more splendid lesson of perseverance, and courage, and amazing achievement, to teach to each succeeding generation, than the untarnished story of Christopher Columbus and his crew. Let him be ashamed to link this historic event with the curse of the spirochete, and let him often pay to the discoverer of his country the tribute so aptly quoted by Professor Edward Channing,

"What if wise men as far back as Ptolemy

Judged that the earth, like an orange, was round,  
None of them ever said, 'Come along, follow me!'

Sail to the West, and the East will be found."

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## Massachusetts Anti-Tuberculosis League.

### SECOND ANNUAL MEETING AND CONFERENCE, APRIL 27, 1916.

#### OPENING REMARKS OF THE PRESIDENT.

By VINCENT Y. BOWDITCH, M.D., BOSTON.

AT this, our second annual meeting, it is well for us to ponder upon the purpose of our League, to take account of what has been accomplished during the past year, and to see wherein we can accomplish the greatest good in the months to come. We cannot emphasize too strongly the purpose for which the League was established, viz.: to keep watch upon the work which is being done throughout the State, to note and encourage those communities where work is being actively done, to stimulate to action those in which possibly there has been, and may still be, indifference as to the importance of all anti-tuberculosis work.

Most, if not all, of you are familiar with the leaflet sent out by our secretary last autumn, signed by our Commissioner of Health, Dr. McLaughlin, by Dr. A. K. Stone, and myself as Chairman of the Trustees of the Massachusetts Hospitals for Consumptives and President of this League respectively. This leaflet was published to counteract a possible tendency towards

the belief that, in consequence of the increase in the number of anti-tuberculosis societies, there is no further need of agitation of this question, which means so much to the health of our State and country.

Strong influence has already been brought to bear upon our legislature by our League in matters of vital importance to the anti-tuberculosis question. Coming as the united opinion of an association, such influence carries greater weight than that emanating from individual effort, no matter how earnest the latter may be.

The results accomplished by our Health Commissioners during the past year in enforcing laws made for the establishment of dispensaries and hospitals in certain communities of Massachusetts have been most gratifying. I feel sure, however, the Commissioners would be among the first to acknowledge the help obtained by the expressions of opinion from, not only our League, but from the Trustees of the Massachusetts Hospitals for Consumptives and others before the legislative leaders.

Much remains to be done, however, and far from feeling that the necessity for such organization as this is lessening, I know that those who are most conversant with facts believe that there never was greater need than now for persistent endeavor on our part to push through legislation in the future. In this connection, I heartily recommend for the perusal of all of our members the admirable paper by Dr. Eugene R. Kelley of the Department of Health, upon Tuberculosis Dispensaries, printed in the Public Health Bulletin of October, 1915, Vol. 2, No. 9. While he naturally recognizes that the work is far from perfect, and leaves much to be desired, yet the fact that the fifty-four cities and towns of Massachusetts which now maintain a dispensary service represent approximately 80 per cent. of the population of the Commonwealth, is very encouraging, considering the comparatively short time since this movement was begun.

It is the function of this League, moreover, to keep watch upon the work thus far accomplished and to see that it does not lag from lack of interest.

Striking examples of what has been admirably done in certain cities and towns are now before us. I cannot refrain from singling out one or two which have come under my special notice, as being an inspiration to others who may be beginning.

No one who has studied the facts about anti-tuberculosis work in New Bedford and who has visited the admirably arranged Sassaquin Hospital in the suburbs of that city, can fail to be struck by the possibilities of what can be done to alleviate the sufferings of the poorer classes and to lessen the ravages of tuberculosis. This hospital, with its remarkable atmosphere of cheer, among even the sickest patients, its practical and at the same time economical construction, may well serve as an example for others to



follow. The fact that it has already been able to cope successfully with the difficult question of the hospitalization of far-advanced cases in New Bedford, that it combines also the elements of a sanatorium and an open-air school for tuberculous children, and finally that it is eagerly sought out by patients and their friends, is one of the most helpful and inspiring examples of what can be done that I know. The fact that that has been largely the work of one of our most zealous and efficient anti-tuberculosis workers, the Rev. William Geoghegan, deserves special mention.

Incidentally, it is an interesting fact that the origin of this movement in New Bedford came from among the foreign class,—the Portuguese, who began with a very small and quite inadequate collection of mere huts for the reception of far-advanced cases. It speaks equally well for the spirit among these people that they cheerfully placed the work which they had begun into the hands of Mr. Geoghegan and his associates, without demanding special recognition or special privileges for themselves. The remarkable growth of the institution in five years, its removal to an excellent situation in the suburbs, is due to the enthusiasm and ability of well-known citizens, notably the late Dr. William N. Swift, and especially to the unrelenting zeal of Mr. Geoghegan.

Beverly is another instance of a city which has made a striking advance in grappling with this question during the past year, largely due to the energy and enthusiasm of those who began the work there—members of our League.

In thus singling out these striking instances, one recognizes also that in many directions throughout the State progressive work is being admirably done, which augurs well for the future.

One need not necessarily be a member of any local anti-tuberculosis society, but as a member of our League he can effectively use his influence in various matters which bear upon the health of the community in which he lives. To help keep alive the knowledge that no patient should be put off by a hasty or careless diagnosis when he is showing persistent signs suggestive of tubercular trouble; to teach others the value of fresh air, good food, regular living, as a means of prevention of disease,—these are subjects in which every member of the League can use his personal influence with marked benefit to the health of all with whom he comes in contact.

In my opening remarks at our meeting last year I mentioned one feature of the anti-tuberculosis campaign which needs the thoughtful consideration of every one, viz.: the control of the incurable consumptive, who by wilful disregard of others, and in spite of protests, persists in filthy habits, thereby spreading infection.

Naturally there comes to most of us a repugnance to drastic methods in controlling such people, but it can and should be accomplished

with firmness consistent with kindness and due regard to the rights of every one. Something must be done in this direction ere long if we are to be successful in controlling the ravages of tuberculosis.

The experience in Australia of Dr. Victor G. Heiser, ex-Director of Health, Philippine Islands, is very significant. By stringent measures there, he tells us that tuberculosis is fast becoming a controllable disease, and isolation of incurable cases is resorted to without delay. Incidentally, other methods which might well be adopted in our community have obtained in Australia, the details of which Dr. Heiser has given in his comparatively recent address in this country.\* It should be read by everyone. In the State of Victoria, Australia, every physician who reports a case of tuberculosis is paid a fee of ten shillings (\$2.50). The Health Department then sends a physician whose duty it is to follow the case. If the family is able to adopt proper precautions at home, the patient is left there and kept under supervision; otherwise, he is removed to a proper hospital or sanatorium. Thus far this method has been adopted, we are told, with perfect success. Why should we not do likewise? Even granting that social conditions possibly make these methods more easily adopted there than here, it should not discourage us in our efforts to bring about the same desirable results. As stated last year, up to 1912 four States had made laws relative to the care of incurable consumptives. New Jersey, New York, Wisconsin and Minnesota, but the marked dissimilarity in legislation makes it difficult to judge of the comparative advantages of each. Results in those States, however, do not compare at all favorably with those of Australia, as stated by Dr. Heiser.

An attempt was made last January to pass a bill through our legislature which should enable us to use strong measures with incurable consumptives, but, as was expected, the bill was not engrossed, for our people have not yet been educated to the point of insisting that such laws offered by our Health Commission shall not only be made, but enforced.

Here again comes the opportunity for the members of our League to influence those with whom they come in contact.

During the last year there has been a marked increase in the number of anti-tuberculosis organizations which have been organized. It is to be hoped that the greater number of these organizations will be of the type which will do more than to hold meetings and to publish reports, but which will be of the type which will do more to educate the public and to influence the legislature.

At the same time, it is to be hoped that the organizations which are already in existence will be able to do more to educate the public and to influence the legislature. It is to be hoped that the organizations which are already in existence will be able to do more to educate the public and to influence the legislature.

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points already touched upon last year as among the most important in the anti-tuberculosis campaign.

First, we must have a more rigid enforcement of the present law requiring all cases of tuberculosis to be reported by the attending physician to the proper authorities. That such enforcement in the present state of public opinion may be at times wrongly a source of embarrassment to the physician in attendance must be recognized; at the same time, the public must be taught that registration, not necessarily meaning discomfort to the patient or friends, is absolutely necessary if the disease is to be brought under control in the future.

Second, a constant endeavor should be made to induce proprietors of mills, factories, and shops to watch the health of their employees more carefully and attend to the hygienic surroundings of their workers. While much has been done in this direction, there is vast room for improvement in the future.

Third, the establishment of open-air schools, not only for those already ill, but for those not afflicted but who need to be fortified against disease, should be urged. No one who has visited the open-air schools in the sanatoria at Westfield, and at Sassaquin in New Bedford, can fail to be impressed by what can be done by such measures to restore health to tuberculous children. I look forward to the day when similar methods can be adopted in all schools, with infinite benefit to the cause of Preventive Medicine.



#### THE PLAN OF THE STATE DEPARTMENT OF HEALTH FOR MORE TUBERCULOSIS HOSPITALS.

By EUGENE R. KELLEY, M.D., Boston,

*Director Division of Communicable Diseases, State Department of Health.*

The plan of the State Department of Health for more tuberculosis hospitals as incorporated in House Bill No. 2042, now before the General Court for consideration, is briefly as follows:

It frankly recognizes two important facts. The first is that there is now inadequate hospital provision for many communities in the Commonwealth, and, generally speaking, no local hospital provision for consumptives for towns of under 10,000 anywhere. The other fact that is equally apparent is that it is impractical and uneconomical to expect small cities and towns to erect and maintain individual hospitals for the care of their consumptives.

A possible way out of this dilemma is the one that was contemplated by the law now in effect, that is, authorizing cities and towns jointly to erect hospitals or to make arrangements for the care of consumptives from small places in hospitals in the adjoining larger cities and towns. From a practical standpoint, this plan has not

been effective, and it is very evident that it never will be. The reason for this is very simple. The tendency is for each community to build scarcely enough beds for its own cases; therefore an agreement to care for patients from smaller, neighboring towns, of which there are several now in existence in the State, is always conditional upon there being available beds which are not desired for the inhabitants of the city that is maintaining the hospital. Such being the situation, it is evident that the only solution that will provide adequate hospital beds for consumptives is one which will procure beds that will be available to citizens of all the towns, no matter how small, when needed.

As a matter of practical experience in this State and other parts of the world, another consideration, only less important than having the beds at all, is the desirability of having these consumptive hospital beds available within reasonable access to the patients' homes.

After a long detailed examination of the situation and a discussion of all the possibilities, the State District Health Officers and the other officials of the State Department of Health unanimously agreed, from the showing made by the investigations of the District Health Officers, that it would not be feasible to put up any plan for coöperative hospitals, to serve a number of cities and towns unless it recognized the existing machinery of government. The only existing machinery of government that stands between the State and the individual cities and towns is the county government. Therefore, it was felt that the most satisfactory plan from a practical standpoint would be one which would utilize the already existing governmental agencies as represented by the county officials.

From the viewpoint of building hospitals only, it would, of course, be equally possible to have additional hospitals built by the State itself. There are several serious obstacles to this plan. In the first place, the State already has invested a very large sum of money in its five institutions for the care of the tuberculous. These institutions do not work out satisfactorily as advanced hospitals, although under present conditions the beds in these institutions are so largely monopolized by the type of case which really belongs in an advanced hospital that it is impossible for them to fulfill their proper functions as sanatoria for the arresting and curing of earlier, favorable cases.

A second and greater objection to the scheme of the State building additional institutions lies in the fact that many of the already existing city and private institutions could be readily enlarged to serve a very much larger district than the immediate city or town for whose use they are now exclusively maintained, but if the State began building additional hospitals it would mean that there would never be any extension of these institutions for the communities which are in close proximity to these local hospitals. From many standpoints, it is more desirable to utilize







# THE RELATION OF THE ANTI-TUBERCULOSIS SOCIETY TO THE LOCAL BOARD OF HEALTH.

BY JOHN W. TAPPER, LYNN, MASS.,

*Chairman, Board of Health.*

As a factor in the conservation of human life, the Anti-Tuberculosis Society can, and should, be one of the most valuable units of the public health machinery. Its field of action is not only extensive but offers immense possibilities as well. Its value and usefulness, however, depend wholly upon wise counsel and the adoption by the society of a definite, fixed policy, so that, as a result of its efforts, may be realized the maximum of benefit. Today, apparently, the one great weakness in the battle against tuberculosis is lack of coöperation among the available forces, because of which we are wasting a lot of valuable energy. I believe this weakness can be wholly eliminated, if frequent conferences are held between the several societies and the local boards of health, upon whom rests, as the name indicates, the burden of conserving the public health. These boards are required to direct their forces not only against tuberculosis, but against many other diseases that may threaten human life. For this very reason, boards of health are given greater power than is given to any other unit of the civic government. The Legislature, however, has very wisely surrounded these boards with certain laws designed to govern their actions, and no matter what the particular type of case may be, the health board must base its actions upon the law in the case, and what is revealed by its investigations. In fact, in all of its efforts and its actions, it is surrounded by law; of which, the law of settlements plays an important part, and the final disposition of the case must depend upon what its investigations reveal. In this phase of its work, it may be materially aided through the assistance of any society whose object is the elimination of some one particular health danger. In this respect, it is true, that today it is possible for almost every health department to avail itself of the assistance of one of a number of different organizations who are seeking to aid the health and comfort of their community, through the reduction of some particular type of disease, in which they have become interested. Of these several organizations that might be mentioned, and which are doing good work, are those interested in Child Welfare, Community Betterment, The Housing Problem, Baby Clinics, Modified Milk Stations, and numerous others; all very worthy and deserving of encouragement. But none of these can be of real value, unless they work in complete harmony with the local board of health. Unfortunately, some do not work with us as they should. This may not be wholly their fault, but, regardless of whose fault it may be, it should not exist. It can be avoided if we but foster the get-together spirit. I wish you to appreciate the real spirit of this criticism, for I

am only trying to point out the many difficulties that boards of health must overcome because the several different organizations at times act independently; that is, oftentimes a board of health is hampered in its work by the actions of an organization which, in its eagerness to do good, defeats the very object of its efforts, simply because it fails to appreciate the value of coöperative work. In other words, it fails because it attempts to solve a problem, the burden of whose solution the State has placed squarely upon the shoulders of the local board of health, and at this very point, we may well ask this question: The State having so placed the burden, can the local board of health, alone, solve the Public Health Problem? I am firmly convinced that no board, no matter how well equipped, can solve this problem without the assistance, backing, and coöperation of the public, and next to the public's support, one of a department's greatest assets is the support of a well organized anti-society, and of these, the greatest opportunity for world-wide good is offered the Anti-Tuberculosis Society. It has been well said, that a community may have as much health as it is willing to pay for. Good health is purchasable, but those agencies entrusted with making the purchase should be chosen wisely and given the coöperation of every individual and organization, that we may in return receive every possible benefit that coöperative efficiency can produce. And here, we may well consider just what part an Anti-Tuberculosis Society may play, and what may be its ideal relation to a local board of health. Quoting from a pamphlet issued in January last by your organization, you say, "Because the State is requiring the construction of tuberculosis hospitals and the maintenance of tuberculosis dispensaries, the impression has gone abroad that there is no further need of an Anti-Tuberculosis Society and committees interested." In the suppression of tuberculosis, if such an impression is really abroad, I am, personally, not in accord with it. Based upon an actual experience covering a period of several years in health work, I am convinced that the need of an Anti-Tuberculosis Society exists today to a greater extent than ever. To discontinue the effective work of the Massachusetts Anti-Tuberculosis League, with its kindred organizations, would, indeed, be not only a step backward, but a most serious blow to the cause. I believe, if it were possible for me to get an expression from the thousands of unfortunate victims throughout this State, their unanimous verdict would be: Tell the League that we need them now as we never needed them before; tell them that we have faith in them, and believe that they should continue to be as a beacon light toward which we may steer our frail craft of hope, confident that, under their watchful care and guidance, our emancipation from this awful affliction will be the more quickly realized. This, I firmly believe, would be the message they would tell me to deliver to you today and, in



giving you this message, I feel that the responsibility rests upon me to urge you to study well the means by which you can best serve them. Let me urge the great value of efficient coöperation with the local boards of health. That is your sphere, and that the only road to your ultimate success. From your past experiences you must have a store of knowledge that should prove immensely valuable to you as a guide.

I believe that your work is just beginning and the first problem that you have to solve in this great crusade is the complete development of a modern anti-tuberculosis organization; that you may not only hold the ground already won, but that you may be enabled to push on to a complete victory. Such an organization should include a working unit in every community, thoroughly organized in every detail. I am quite confident of the good results that would accrue, if these city and town societies were made a working unit of a State league, made up of representatives from the local anti-societies. Frequent conferences should be held with the local board of health in order that duplication of effort, and consequent embarrassing situations, may be avoided. It is not my intention in any way to attempt to map out in detail any definite line of action, because I am too well aware of the widely different conditions that obtain in the different communities. I fully realize that in the community maintaining an active health department the real function of an Anti-Tuberculosis Society is more of an educational one. It should, in a great measure, confine its efforts to the dissemination of information, covering not only the care of predisposed tubercular persons, but including in its activities a complete study of the entire social problem as well. This study may well include the housing and lodging house problems; the employment of arrested cases and every other phase of their social welfare. This work you may well do, but it should be carried on in complete harmony and coöperation with the local boards of health. You should never attempt to handle an actual case of tuberculosis without first obtaining a complete understanding with the health department, that you may keep fully informed of just what that department may have done in the particular case in which you have become interested. I want to emphasize this point, but to illustrate more fully, let me cite several cases, that I may show you what may rightly be termed ill-advised attempts to handle an actual tuberculosis patient, and its resultant bad effect.

CASE A. This patient was sent by a private society to a local hospital. Diagnosis of tubercular ulcer made. Patient was operated upon. After several weeks' stay in the local hospital, arrangements were made and patient sent to a convalescent charitable home. Upon admission and examination of the patient, the society interested was notified to remove the patient at once as she was suffering from three or four discharging tubercular ulcers on leg, and otherwise not a fit case for this home. The board of health was then notified and

asked to relieve the society. This was done and the patient sent to the local tuberculosis sanatorium, where she should have gone in the first place, and the consequent exposure of others would have been avoided.

CASE B. In this case, the board of health was notified and plans made for the removal and cure of patient, because home conditions were unsatisfactory, and sufficient means to handle case at home were lacking. Consent of patient and mother of patient obtained for removal to sanatorium. After all arrangements for the care and removal of patient had been completed, patient was visited by worker from private society and advised to move from home where they were to another location, and to remain at home. Patient, thinking financial help would come from private society, accepted advice, and disregarded all previous arrangements made by the board of health. After patient had gone to the expense of moving, very little assistance was given by the society who had interfered. This patient lived eleven months. Was a bed case the entire time. After waiting for expected help from this society, and not receiving it, patient and mother realized their mistake, and asked our social worker to provide milk and other necessities. These were provided as patient's condition at this point made removal seem unwise.

CASE C. Board of health was notified, visited patient, found home conditions very bad. Patient was advised to go to our local tuberculosis hospital to await admission to Rutland Sanatorium. Private society advised sending patient to New Hampshire, they paying board for a given number of weeks. Our social worker, knowing the patient's condition, advised against this plan; fearing patient would exercise too much when rest and medical supervision were needed. Notwithstanding this advice, patient went to New Hampshire, remaining there about three months, returning home feeling improved. Visited our dispensary and requested that application be made for admission to the Rutland Sanatorium. This admission was refused because being too far advanced. After many weeks of unsatisfactory home treatment patient entered a local tuberculosis hospital, death occurring a few months later.

CASE D. This patient, a man having a wife and four children, was examined at our local convalescent home, and advised to go to a local tuberculosis hospital pending admission to Rutland Sanatorium. Patient wished to take home treatment, promising to go to dispensary, and if he did not improve to enter the sanatorium. Home conditions were unsatisfactory, but a piazza was put in condition for convalescing purposes. Not improving, patient entered a local hospital; his family were kept from the hospital, as care provided by a mother and father, and other T. B. friends. After three months in hospital, and after taking a long vacation, patient returned as soon as he was able to his home, where he remained previous to his death. He was visited by outside workers, but no family application was made for help. This was a case where the patient and his family were not properly advised, and their financial condition was not taken into consideration time to prevent the patient from returning home. The patient lived about six months.



ing to support his family without the aid of the Poor Department.

You will note in every instance, no attempt was made to work with our local board until the case became a burden and they wanted to drop it.

We might cite a number of other cases to show how an active health department may be handicapped by workers seeking to do good, but who oftentimes are only undoing work which may have taken the health department several weeks to accomplish. Our department early recognized the fact, that every case presents some peculiar phase which requires individual treatment of its own. In fact, all cases differ, thus making it impossible to adopt any hard and fast rule to cover all cases alike. It also frequently happens that a physician, for reasons best known to himself, and in the interest of his patient, deems it wise not to make known to his patient just what his or her actual condition might be. Our board, appreciating this situation, has suggested to all local physicians, that in the event of their having a patient from whom they wish temporarily to withhold the true diagnosis of their case, our department, if requested, would defer its action until such time as the physician might feel that we could with safety take up the case. In almost every instance we find that this rule works decidedly in the interest of the patient and for the better understanding between the physicians and the board of health. The public is safeguarded and the comfort and happiness of the patient are not disturbed. It also encourages that get-together spirit, so essential if success in this fight is to be attained.

In conclusion, may I express it as my firm belief that, having lived to see the dawn of a new knowledge, to have seen that knowledge dispel ignorance and apathy, through which tuberculosis levied its pitiless toll on human life, unheeded and unhampered; having lived to see a substantial decrease in the death rate from this dread disease, we may yet live to see the open gateway to complete success, with all that it means to science, philanthropy, and the brotherhood of man. But you and I can never hope to enter that gateway alone; we must go together.

#### THE VISTING TUBERCULOSIS NURSE.

BY MARY VAN ZILE, R.N., BEVERLY.

In last year's report of the Massachusetts Anti-Tuberculosis League there appeared a paper by Miss Amy F. Aetion on "Tuberculosis Work in this State." With the point of view of the Chief Inspector of Incorporated Charities of the State Board of Charities, Miss Aetion comes to the conclusion that the chief function of an anti-tuberculosis society is to educate. She says,

"As I conceive it, the work of the private society is to gather information touching cause and prevention of tuberculosis, by studies and other means; to disseminate it as widely as possible; and to interest the public to support necessary legislation." This is to be done by "popular lectures, moving picture films, exhibits in schools, shop windows, etc., leaflets in different languages, popular articles in the press, competitive essays by school children, and all other educational methods which human ingenuity can devise. Ideas presented thus reach a vast number of persons at a stage where suggestions for avoiding this disease may be helpful and before control becomes necessary."

If this is to be done by Anti-Tuberculosis societies, the Public Health Nurse, being the home teacher, must, as the agent of the Society, work on that line. For "it is not what scientists know but what people apply that marks our progress." It may interest you, therefore, to see how a practical nurse had come to this same conclusion, through quite different ramifications of experience.

In the beginning of tuberculosis nursing one is somewhat appalled by the complexity of the problem; sickness of such duration as usually to bring poverty and discouragement, and gradual lowering of the standard of living. One may know tuberculosis from A to Z theoretically and technically, and even the best practice in handling these cases socially, yet the first visit in an afflicted home may seem staggering in its need. To find the wage-earning father needing sanatorium care; the older children with defective eyes and throats and faulty posture, all tending toward infection; to see the baby sickly and miserable despite, perhaps, the best efforts of an ignorant mother. All this makes the nurse feel the necessity to coördinate the organized agencies to help this family. Where shall she begin and where will the process end?

#### Care of the Tuberculous.

First, the public must be educated to provide sufficient and efficient care for its consumptives, enough hospitals so that when the man has consented, after much persuasion, to take sanatorium treatment he will neither die nor become discouraged before being admitted. Also the nurse feels the need of provision for the uncontrollable, careless consumptive, and of the law to enforce his removal if he will not take necessary precautions against infecting his children. Here especially she must have the support of Anti-Tuberculosis Societies in introducing and enforcing good laws. The members of these societies are usually the influential people of the community who, by understanding the need and instructing their legislators, can do much to furnish a background for more efficient work. Dr. Linsley R. Williams of the State Department of Health of New York, speaking of the segregation law in that State said, "Though few cases



have forcibly been sent to hospitals we count ourselves extremely fortunate in having such a law behind our work."

### *Inspection and Regulation of Working Places.*

In her search for the cause of infection with tuberculosis the nurse hears frequently of "the man working beside me who coughed and expectorated constantly"—pointing to the need of more unprejudiced inspection of working places. These older children when sent to work should not carry infection into the home. The Anti-Tuberculosis Society may take its part in regulating the construction of factories and the conditions of work, the wages and hours of employment and in instituting health insurance.

### *Provision of Prescribed Treatment for Children.*

Medical inspection of schools is required by law in Massachusetts, but the child in a family will not be benefited merely by a report from school that his eyesight and teeth are defective, that his adenoids should be removed. *The treatment must be given.* If it is found that the parents have more expenses than can be covered by their wages the city should provide means of making the child an efficient citizen. According to insurance calculations a child between 10 and 20 years is worth \$2,000 to the State, and a wage-earner between 20 and 30 is worth \$4,000. Therefore the city can well afford to spend \$10 a year on the health of each child to save his life and promote his wage-earning efficiency. To be well and healthy the child must have physical development and recreation, and to be happy and healthy-minded he must have culture.

Let the Anti-Tuberculosis Societies encourage the support of gymnasiums and playgrounds, children's libraries and picture galleries. Let them censor, to some extent, the motion picture shows, to see that they are educative and inspiring rather than sensational. Let nature-study be provided to go hand in hand with the school teaching of physiology and hygiene, thus guarding against the mistakes of adolescence.

### *Instruction of the Home Makers.*

We note in our family a sickly baby and others, under-nourished, due probably to low wages and the decrease of income with sickness, but partly due also to the waste of material because of the ignorance of the home maker.

*Instruction of Mothers* should begin with girls of school age and be supplemented later by instruction in care of babies and children. The nurse and visiting housekeeper are the most practical teachers in this line. To demonstrate this need some societies provide visiting housekeepers to begin in the homes of tuberculous patients with instruction in the buying and preparation of food. Later city authorities may become convinced of the economy of such teaching and extend the service.

### *Regulation of Building and Renovation of Houses.*

A very great need in tuberculosis work and in health work, as the nurse sees it, is the building of better houses and the right to condemn and destroy unsuitable tenements. Many a workman spends a quarter of his income on shelter for his family and gets therefrom disease and immorality and unhappiness. *Pure air, pure food and safe water*, with facilities for disposal of waste, are only a fair allowance for all taxpayers. Here the more intelligent citizens can make valuable reforms.

### *Co-operation of all Public and Private Agencies.*

The family problem requires much planning and an appeal to many agencies, public and private. The duty of the nurse and her society is—not to give this aid, but to procure it from the organizations already formed for the relief of just such conditions. The Board of Health is empowered to help in sickness, the Poor Department in poverty, and private relief agencies and clubs have for generations given a helping hand when appealed to. Why, because we are dealing with tuberculosis, need the Anti-Tuberculosis Society be added to the list of relief-giving agencies? In dispensary work the giving of medicines or relief diverts the attention of the patient from the importance of the physician's advice and frequently leads to needless pauperization.

Much more profitable and constructive is the education which may prevent sickness and so strike at the root of the difficulty.

### *Co-ordination of the Public Health Nursing of the Community.*

The great waste in the nursing field is in duplication of effort. When the school nurse and the district nurse and the tuberculosis nurse are found to be visiting this family for different purposes and at different times, they will give conflicting advice, and must keep unnecessary records. The result is confusion of mind for the family, and the loss of the personal influence of any one nurse.

So valuable an asset in public health nursing is the fellow-feeling between nurse and patient, that any amount of technique and system may well be sacrificed for this human touch. When the time comes to persuade this man to go to the sanatorium, it will be the nurse who has helped in other emergencies—when the baby was born, when the children were sent to school or to work, who will be able to reach the father to save his health for his family.

It is most desirable to work toward the organization of all public health nursing under one supervisor, as is being done in New York, Cleveland, Boston, Fall River, Detroit, Chicago, St. Louis. Especially in areas for new work in smaller communities it is well to co-ordinate the nursing, better still to place the public health



the care of all indigent sick. Here can be centralized all public care, including that of the city physician, the dispensary and the school physician, making use also of the power of boards of health and the facilities of private agencies.

But above all the system and the executive efficiency, the visiting nurse must herself have the touch feeling with her patient. She must see his predicament as he sees it and adjust her plan to his individual need, remembering always that though she may procure for him and his family all the advice of the medical authorities and all the goods of her co-operating agencies, without charity it will profit him nothing. He will become embittered and disheartened unless by her courage and helpful spirit she can show him the way out, the purpose and object of all his struggle for health.

### TUBERCULOSIS IN RURAL COMMUNITIES.

BY VANDEPOEL ADRIANCE, M.D., WILLIAMSTOWN, MASS.

THE mortality rate of New York City is now lower than that of the rural part of New York state. A few years ago this would have seemed quite impossible, for the opposite relationship prevailed. The science of sanitation has apparently accomplished a reversal of what ordinarily prevails. This can be explained only by assuming that the inhabitants of the countryside are not receiving the same good care that protects the inhabitants of our greatest city from preventative disease.

In matters pertaining to the disease we are discussing today, namely, tuberculosis, the rural population of New York as well as Massachusetts may well consider that they do not have as much done for them as the members of the cities of their respective states. The problems of tuberculosis have been faced in the cities of our Commonwealth and when the cities have been tardy in providing sanatoria and dispensaries the State Board of Health has called attention to delinquencies. The state has overseen, encouraged and even forced some control of the tuberculosis problems in cities over 10,000. This touches two and one-half million lives, but more than three quarters of a million living in towns of less population, and particularly in the farming districts of our countryside, may well consider that they have been neglected. Unfortunately although tuberculosis reaps a large harvest in their midst these people are apt to think the factor too small to be seriously considered. They will be found not only indifferent but even hostile to any agitation or legislation which rests upon the acknowledgment that the disease is prevalent among them. Even the local boards of health, which should be foremost in public health work, take but little in-

terest in the problem and view with indifference the customary laxness of the medical profession in diagnosing and reporting cases of the disease.

Under such conditions the first step in educating is to convince the people that tuberculosis exists in their particular community.

When the local association was formed with which I had some acquaintance, a supposedly well equipped physician said to me, "What is the use?—there are no consumptives in this community." When I showed him that nine deaths from the disease stood on the town records of that year, he could only take refuge in the assertion that the diagnoses were incorrect. Let it be admitted that sometimes even in the medical profession we find bliss and ignorance combined.

To undertake the work in rural communities it seems wise to begin with a thorough understanding of the problem. Nothing can help so much as to empower the State Board of Health to make an accurate survey of rural tubercular conditions. This cannot be done without the appointment of additional helpers. It seems wise to urge the necessity of the appointment of a nurse in each health district who shall work in harmony with the health officer. With such an increase in his staff, it is thought that our competent Commissioner, Dr. McLaughlin, will be able to collect the facts which will lead to a proper understanding of the problem and eventually permit of the control not only of tuberculosis but of other communicable diseases. It seems to be our duty so to influence legislation that our commissioner will be able to carry out this prospective survey.

Let the anti-tuberculosis workers of the state advocate wise legislation, but let them also encourage and take active part in the formation of anti-tuberculosis associations in our smaller communities. That there is plenty of opportunity for this work appears from the statement, based on credible information, that in towns of less than 10,000 in our Commonwealth, there is only one active anti-tuberculosis association. Associations which take up their duties in smaller communities can do very effective work by co-operation with all the allied agencies so that in that Utopian day when the State Department of Health assumes complete control of the work, they will find preparation has made their task easier.

A most efficient method must be by the establishment of these branch organizations which coöperate with the National and Massachusetts Anti-Tuberculosis Associations. The day of the local anti-tuberculosis association has not passed. Its duties are just beginning in these rural communities and we can but hope that many modest but active associations will soon come into existence, doing their work as nobly and as effectually as those of the cities.

The review of the annual report of a well organized anti-tuberculosis association in which



attention is called to the prominent citizens on the board, the expert physicians who advise the corps of trained nurses, the well equipped hospitals, sanitarium and dispensaries, is depressing for the would-be worker of the rural community. It is easy to succumb to discouragement and quickly acknowledge that with the scanty talent at hand nothing can be accomplished.

In the fight against the white plague there is no room for such pessimism. No one can read Trudeau's Autobiography without being impressed with the optimism which he preached and which mastered him, and no one can claim such isolation that nothing can be accomplished in his hamlet. May many a neglected town develop workers with a Trudeau-like spirit! Although their names may never be acclaimed like his, their opportunities in the service of mankind promise much more than he ever dreamt the primitive lumbering camp of Saranac held for him.

The consumptives of a rural community will vary according to the population but they will seldom be numerous; and the smaller the town, the fewer will be the patients accepting charity. Sociological questions will be such as to make few exacting demands upon the officers, and many workers will not be needed; but a few workers can accomplish much. An interested physician is indispensable and, if the community is large enough, a trained nurse may be well employed in the field. In the larger towns all of the nurse's time may be needed, but it is more likely that it will be found wise to employ only part of a nurse's time in the smaller towns. In this case a convenient arrangement can be made with the local charity organizations, the nurses' associations, the Foresters, the churches, or other interested societies.

The object of the newborn organization should be to maintain a central organization for keeping information about tubercular patients,—to keep in touch with these patients, referring them to sanitarium if necessary and to keep acquainted with patients who are sent to the community from sanitarium.

The other duties, which are axiomatic, will be omitted before this audience, so well educated in tuberculosis work.

As the years go by no earnest worker in rural communities can fail to be convinced that he has a large educational opportunity, and as his experience increases he will find that where the field of social service is limited, the main function of his organization must be educational. There are plenty of opportunities to give talks before granges, churches, Foresters, etc. It is disappointing to find the school children are not given the privilege of instruction in tuberculosis, although the laws of the Commonwealth particularly prescribe it. It appears to be the duty of the local anti-tuberculosis association to see that instruction is given in the nature and prevention of tuberculosis. One of the methods easily adopted is by means of the set of lantern

slides which are supplied by the National Association and are accompanied by a regular printed lecture which can be amplified if desired. The talk of about twenty minutes and the pictures never fail to make an impression and can be used for children in the higher grades, whereas simpler exhibits can be easily secured to vary the instruction. When talks are given the opportunity should never be neglected to give printed pamphlets to the children, who eagerly accept them and carry the message to the home circle. The superintendent of schools will gladly give the speaker the opportunity to talk, for it relieves the teachers of instructing on a subject upon which they feel ill prepared.

Moving pictures have been used with great success in some communities. It takes little effort to arrange for a complete program of films furnished by the National Association. By co-operation with the local movie manager tickets for all the children in the upper grades can be secured at a moderate price, and while enjoying a treat, the school children obtain lasting impressions.

Our main hope in this campaign is in the children of today who will be the workers of the next generation. May they be properly acquainted with the great facts which our generation missed! It is our duty to see that heredity as a factor is entirely erased from the black board and that the individual unit will not endeavor to blame his prenatal condition for his unhealthy state. It is our assurance that education of the school children of today will do more to cut down the number of consumptives of twenty years hence than any other factor. Let the tuberculosis worker of the rural community pound in these facts if he neglects all others and he will have accomplished much.

We must spread broadcast, by whatever means we have, the fact that "tuberculosis is a song begun in the cradle of the infant." The child is the beginning and the solution of the anti-tuberculosis problem. We may be too late to save the diseased of the present generation, but if the children of today are taught what we wish them to know, the devoted fathers and loving mothers of another generation will see that their offspring is protected even if their lives have paid the price of ignorance.

With the children, education appears to me as the most important aspect of the problem, for they are easily reached and they are the future. I would suggest that the State Board of Health take upon itself the duty of securing that the present laws in relation to the education of school children are enforced.

There is a great deal to be said for the tuberculosis problem with children. It is a problem which should be given the most careful consideration, and that the State Board of Health should take upon itself the duty of securing that the present laws in relation to the education of school children are enforced.



said about the characteristics of the disease it causes, until now a few of the laity appreciate some of the essential facts which have been driven home by such interested people as present themselves here today.

There is another type of bacillus, however, namely, the bovine type. It is well known to bacteriologists and specialists upon the subject of tuberculosis, but this germ provokes little interest from the majority of the medical profession and the laity.

The bovine type of germ is purveyed to inhabitants of city and town alike by the farmers of our rural communities. If the inhabitants of Massachusetts are not well instructed in regard to the old fashioned type of pulmonary consumption, they certainly need instruction in regard to the tuberculosis which is caused by the bovine type of bacillus. The evidence against the bovine bacillus has accumulated at a rapid pace and it is time some steps were taken to guard against it. It infects adults and children, but as the germ is carried to us chiefly in the milk, it is not strange that the milk consumers, and particularly the children, are affected. The children under five years are the chief sufferers, be they residents of city or country. This is a menace to the children of the city as well as the country. Any rural anti-tuberculosis worker must hail the day when a regular campaign of education is begun in regard to the dangers of milk from tubercular cows. The entire state is aimed against and the rural communities are the sinners in producing the infected milk.

The results of individual investigators, as well as the British Royal Commission on tuberculosis and the German Commission, show that there is a considerable percentage of bone, joint, abdominal and lymph gland tuberculosis which is bovine in origin. By far the most convincing work on this subject comes from Park and Krumwiede of the Research Laboratory of the New York City Board of Health. They have themselves studied 478 cases and, after adding the cases observed by others, their tables show altogether 1,511 tuberculosis cases. After tabulating and reviewing the subject they conclude 12.5% of fatal cases in children under five years were due to bovine infections, while in the total series about one quarter (26%) of all the cases under five years were bovine infections.

This paper is not strictly scientific and the writer must be excused if he fails carefully to quote all the investigators who have become convinced of the danger from the milk; but it seems wise to mention a few suggestive references.

Orth says 10% of all tuberculosis in children is due to bovine infection. An English observer says not less than 25% of the tuberculous children under five years of age suffer from an infection of bovine origin. It is possible to quote many authorities for the accepted fact that a great deal of tuberculosis in children is due to milk from infected cows. A. Stanley

Griffith, in a study of tubercular cervical glands, showed that the proportion of bovine infections reached as high as 90% in the children that he examined under five years of age.

It is not wise to trespass upon the ground of the veterinarian, but it cannot be doubted that there is a great deal of tuberculosis in the dairy cows of the United States. Chief Melvin, of the Federal Bureau of Animal Industry, and Professor Moore, of Cornell, concur in the opinion that not less than 10% are affected.

In our own state, between 1893 and 1908, 10,688 were found to be tuberculous by the tuberculin test, as well as at post-mortem examination.

A. P. Mitchell of Edinburgh, in a study of the frequency of bovine tuberculosis in cervical adenitis, found out of seventy-two cases sixty-five yielded the bovine variety and only seven the human type. He was not surprised, on making an examination of 406 samples of milk collected from as many shops of his Scotch capital, that 20% of them contained the germ of bovine tuberculosis.

The Department of Health of New York City examined 78 samples of milk, 11½% of which showed virulent tubercle bacilli.

Unselected raw milk, taken at random from various cities, show virulent bovine tubercle bacilli in from 10 to 20% of the samples.

There appear to be two ways to do away with the danger of infected milk. First, do away with all infected cows. There is no time to go into details in discussing this impossible procedure. Science and economy would not favor such wholesale slaughter and it is not for us to urge such foolhardy legislation upon the state.

A more practical method is offered in the pasteurization of all milk—a measure which our State Board of Health heartily favors. This process does away with the danger of other infections than tuberculosis and, while being a good hygienic measure, is the most economical and surest way of removing all danger of the transmission of tuberculosis through milk.

#### SUMMARY.

1. Rural communities are very ignorant of the prevalence of tuberculosis.
2. Rural communities have been neglected in the anti-tuberculosis campaign.
3. The formation of anti-tuberculosis associations should be encouraged in such communities.
4. The State Board of Health should be encouraged to make a thorough survey of the prevalence of the disease.
5. The State Board of Health should enforce the law which demands instruction about tuberculosis in the public schools.
6. Instruction is needed in regard to bovine tuberculosis.
7. Bovine tuberculosis is commonly conveyed through the milk and is a menace, particularly to children under five years of age.
8. There should be a state law compelling the pasteurization of all milk.



## SOME PROBLEMS OF THE TRUSTEES OF MASSACHUSETTS HOSPITALS FOR CONSUMPTIVES.

BY ARTHUR K. STONE, M.D., BOSTON.

A GREAT ray of sunlight has come to us who have been combating the almost insuperable difficulties surrounding the tuberculosis questions, in the report from Australia of a fall in the death rate to 8 per 1,000 and of the practical disappearance of the tuberculosis question in Victoria.

Even should this latter report be premature, nevertheless, the fact that it can be made by a man of the standing of Dr. Heiser shows that efforts which have been put forward and pushed in spite of failure, mistakes and hostile criticism are along correct lines, for the Victorian victory is but the triumph of segregation and isolation of the patients with this disease.

This gives us here in Massachusetts courage to go ahead and press the laws which we have on our statute books, and should encourage every worker in the individual societies, which make up the League, to work with redoubled energy—not flagging zeal—to spread the health education from the so-called intelligent classes to the most needy and ignorant persons in our midst, always remembering that the well-to-do persons are often the most ignorant.

First of all, let us do what we can to help out the laws which have been proposed to provide hospital accommodations for all who wish and need the protection of the hospital for themselves and for the good of their families.

Let us show to our friends in the legislature the needs in every town, so that we may have the necessary places for segregation of the active tuberculosis patient. Then when that has been accomplished, the dispensaries will begin to pick up the early and suspicious cases and transfer them at once to Rutland and the other sanatoria where the chance of arresting the disease is greatest.

The plans for the general segregation and treatment are complete. They have not as yet been carried to the fulfillment and cannot be for several years to come, under the most speedy conditions. But the fulfillment of the plans can be but a matter of time. Brookline has built a charming little hospital. The Barnstable County Commissioners have been studying their problem. Lowell has selected its site and—this settled—must soon take itself out of the group of laggards. New Bedford will soon increase its facilities—the energetic Mr. Geoghegan assures us—and put itself still further in the lead of all the Massachusetts cities. Malden for the moment is held up by a new mayor. Fall River will build a hospital commensurate to its needs and not be content with one of about one-third the proper size. All this is of the greatest encouragement and gives promise of greater advances in the future.

The move made by the State Board of Char-

ity to raise its payments for state cases from \$7 per week to a sum nearer to the actual cost of maintenance in the various local hospitals will do much to diminish the discount which one finds cropping out regarding so-called state cases.

There is earnest work in all directions being done by the Department of Health and there is the fullest cooperation of that Department and the Trustees of Hospitals for Consumptives, this cooperation manifesting itself in the constant courtesies between the Inspectors of Health and the physicians in the districts and our after-care worker, who does much to help them in many outlying districts; and on the side of the towns and cities, the dispensary nurses are helping and taking the burden from our after-care worker in many communities; and doubtless the time will not be far distant when other cities and towns will be able to report all that she wants to know by the mere writing of a letter.

But although much in the way of cooperation has been accomplished, there are still communities where the idea of getting in step and making a mighty effort to get the upper hand of the tuberculosis problem does not seem to have penetrated. There are boards of health who seem to prefer to see how little they can do, who will not acknowledge that they have any tuberculosis to deal with; who only know those few cases reported by physicians and who make no attempt to have all cases reported; who point with pride to an unsuccessful clinic and who seem to gloat if they can find an advanced case that they can force upon the state sanatoria. A few boards have all of these uncoöperative tendencies—and many more develop some one or two of them. The point of view of the state policy is misunderstood and opposed. That there are reasons for such misunderstandings, I can well appreciate, but I know that every one in the Hospital Department and in the Department of Health and in the Board of Charity would be willing and glad to talk to any disgruntled and perplexed individual to try to smooth out these difficulties; and with a little more cordial getting together many of the misunderstandings can be done away with. So when you, as workers in the cause, hear of misunderstandings, urge a personal interview and see if the matter cannot be straightened out.

A perpetual problem for the Trustees of the Hospitals for Consumptives is the difficulty of administration. In the four sanatoria are gathered together a thousand patients. Gentle and Jew, white and colored, and native and foreign born, even to the dwellers of China and Mesopotamia, united in the common belief that they are the victims of the terrible tuberculosis, and must die.

It is not to be wondered at that many of the patients are honestly often uncoöperative, and even rebellious. Their manner of life has been dominated almost entirely by science and they



are expected to conform to institution rules and regulations which should be strict so as to secure for the patient the greatest chance for recovery and return to economic usefulness in the shortest possible time.

The response of the patients to hospital life is very different. The great majority say that they wish to get well and they think they mean it, but in spite of this many of them drift into the indifferent class, apparently quite content to eat and sleep, and beyond that to do little to help themselves or their neighbors to improve. This group of seemingly indifferent people are a great drag on the medical staff and upon those patients who are zealously trying to return to health and work. The boundary line in this group is very indistinct and many would be surprised to be considered therein. Some are only there occasionally, sliding down in a fit of the blues, while at the other end, a few drop down from the indifferent group into the undesirable class; that is, the group to whom all rules and regulations are anathema and their whole attitude is one of opposition to authority.

We have to take the men and women as they come, with various undesirable habits fastened upon them, and they do not leave these at the doors of the institutions. Some of these habits have been a factor in their undoing and falling a victim to the bacilli of tuberculosis—but by them this fact is usually not recognized.

With this heterogeneous mass of patients the institutions have to deal. The work is for a great part educational, trying to show why the rules and the regulations are made and why their enforcement is necessary. The coöperation that is secured between the staff and the patient has to be founded on intelligence and not on discipline, and yet there must be a line where forbearance and patience cease to be virtues and discipline must be maintained. For the intractable group of patients, of whom there are many in the community, and the Boards of Health are in touch with many more of them, because only too often they will not enter voluntarily any institution—there must come some place where these persons who are a menace to the community can be segregated; where they will be under control as menaces to the public health and not allowed to endanger the wellbeing of others. This to my mind must follow quickly on the establishment of all the necessary local hospitals that are now planned. It is, however, to be hoped that with the spread of education and temperance reform, and other uplift work, that this group may grow so small as to become a negligible factor in the tuberculosis campaign.

It is to my mind a debatable question whether the state should build a new institution to which should be sent the intractable and indifferent patients and those state cases which do not belong in the Tewksbury group and for whom there is no provision in the local hospitals, or whether one of our present institutions can be enlarged

to advantage so as to take care of these cases and to use the other three for the really early and curable cases.

Again, what is to be the future of the work for children? The start at Westfield is most encouraging. Is it to be developed then to the exclusion of adults and will this very growth among the children make a new state institution necessary?

These are perplexing questions which I find it difficult to answer, practically impossible of answer until the new hospitals are in full working order.

In a recent bulletin of the New York Department of Health the statement is made that the nurses of the department were finding five cases of tuberculosis for every death reported. The Industrial Accident Board are having cases of tuberculosis put up to them as industrial accidents and there are judicial decisions which make it possible that such claims may be allowed. If that is so the employers of labor will have to protect themselves by physical examination of their employees, and there will be a demand for sanatorium treatment of many very early and suspicious cases such as never before has arisen. Are we as yet, in our plans, even prepared to meet this probable demand for early sanatoria treatment?

In New York City there has been such pressure for beds for active cases that we are told that patients are discharged who have a certain number of negative sputum tests. This is an entire abandonment of all attempt of cure for purposes of segregation. The emphasis is put on the community at the expense of the individual. This extreme position does not seem to me justified; persons with tuberculosis should be segregated, it is true, but, if possible, they should be cured and returned to the community, able to be useful citizens once more. Arrest of the disease and return to economic usefulness should be the purpose of the state in its work as well as mere segregation.

Nevertheless, there are a number of patients who, after a period of progress, seem to come to a standstill, or the progress is very slow, indeed. Some, though this active progress is arrested, show that they can never become self-supporting, active citizens again. They can live—and live happily—under the protecting walls of an institution. Some of these persistently have bacilli and some never have bacilli or, at most, at rare intervals.

What shall be the attitude of the state to these persons? In the course of years, groups of this class of patients tend to collect at various institutions. What shall be done with them? To this group must be added the group of patients where, in spite of marked symptoms and signs in their lungs, there is nevertheless grave doubt whether the process is even that of real tuberculosis, but rather of so-called chronic bronchitis or bronchiectasis. These people are sick and suffering, but they are not,







Massachusetts says shall be done. This minimum is in the statutes, the laws relating to tuberculosis. To create hearty opinion in favor of these laws is a fundamental part of any program. It may be the law relating to a hospital, county or otherwise; to a dispensary, or to examination of school children, or giving information about tuberculosis in the school. Are all four laws carried out? If not, why not? All that you have obtained in the way of facts from your study of individual families cared for by other agencies or your own, use to show the need of law enforcement. Always—"When in doubt, trumps." Education is the "trumps" of the tuberculosis campaign. Public opinion we must have. Use your facts to make people care and to make them work. It is interesting that in the morning program the boards of health gentlemen talk, so they are here; in the afternoon they are not on the program and I am afraid they are not here, Mr. Chairman. I am sorry, because we are going to talk a little about them and it is so much pleasanter to do it in their presence. One question that was emphasized this morning was the need of complete harmony between the tuberculosis association and the local board of health. I should think that complete harmony, absolute harmony, would be possible under two conditions: One where you have two progressive groups, each of a high standard of efficiency, having vision, with a common understanding of the problem and much respect for each other, going ahead without jealousy, without friction, with continuous coöperation, and discussing matters and together evolving action so that it is hard to tell who was really the initiator of this policy or that. The other instance of complete harmony would seem to be where you have two equally inactive bodies. Very often, however, you have one active body and the other inactive. The inactive body may be either the tuberculosis association or the board of health, but when the situation exists, ten to one, each thinks the other more than a little queer. Then there is lack of complete harmony, but it seems to me that a community in that situation is much better off than one where there is absolute harmony and united inaction. I am just as ardent an apostle of coöperation as the preceding gentlemen, but I am no believer in coöperation in inactivity. I think that a good solid, impersonal fight, with an awakened public to judge between us, is more effective for the prevention of tuberculosis than where the lion and the lamb are lying down together peacefully asleep.

To return to our program. What more shall it include? Added to the enforcement of the laws of the State, there is the open-air school program, of which mention has been made so often at your meetings. On the educational side there is the work referred to here this morning,—the work of getting the facts as they are, whether they come from our own streets, from New Zealand or Australia, before the public, whether

in the form of a pamphlet, a leaflet or in moving picture. The gentleman from Haverhill said we do not all speak the same language. In addition to the use of the foreign press, we may be able to teach parents through the children as is now being tried in New York, where the school board has given hundreds of thousands of pamphlets, on how to reduce the cost of living through careful buying and good cooking.

One method of education where I think we have been singularly lax, is in not making a great deal more use than we have of our cured cases. We might all take a lesson from the temperance platform, where the man who has been reformed comes and talks to the people. We have plenty of patients who have been cured. In our chairman's address a year ago, he told of a teacher who had been cured and able to continue teaching for seventeen years. That teacher, who had tuberculosis, who has since been teaching for seventeen years, on your movie stage or on your speaking platform, could do more to make patients willing to go to a hospital and give the public an appreciation of what hospital care means, and prevent hysterical fear of arrested and cured cases, than any one of us here. Especially in educational work for different nationalities, a cured person of that nationality, even if he is not a "speech-maker," his presence at a meeting where his countrymen can see him cured and working again in their midst, is in itself an effective object lesson.

Again, what shall our program be? Some of you are conducting hospitals, some of you are maintaining dispensaries; most of you who are doing that work are doing it so well that it is a very difficult and capacious thing for anyone to criticize. But remember that just so far as institutions have their dangers, those dangers apply to you. I mean by their "dangers" their very virtue, their very efficiency, their very seeming adequacy. Here you have a well-run institution, and that is a real achievement; what strength have you left for your work outside the institution? You exist first as an association to prevent tuberculosis.

It was stated this morning that the State has called upon your board of health actually to do those things; the Commonwealth has legislated that your board of health shall maintain your dispensary and shall conduct your hospital. You do it, some of you say, because you cannot trust your board of health. It seems to me that the work that the board of health does in tuberculosis is a barometer of its general work. I understand that a barometer does not mean that it always rains when it says it will, that there are exceptions. Therefore I do not choose the thermometer which is an exact register. Please note the difference. I understand there is a board of health represented here that does excellent work in everything except tuberculosis. I know one tuberculosis organization here that has said it could not hand over to its board of



health the splendid institutional work it was doing because it could not trust the board of health. Not long ago that very board of health was startled to find that a case it had diagnosed as chicken pox was in fact smallpox, and the delay of the health board in following the diagnosis of others was extremely disquieting. You are trusting your board of health with life and death every day; so when you take away from its care this special form of life or death, do not forget you are leaving it with the great responsibility for the health of your citizens. It pays to go behind the apparent necessity of doing this or that thing yourself, because you cannot do the whole thing yourself. A big part of your job is to make the public realize that the whole health work has to be done well. I know places where at this moment, if I were a trustee of a hospital, I should hate to hand it over to the public body; but I hope I should have courage to say why, before every election, and work hard to get a board of health I could trust. There are boards of health we all respect and fully trust and we must work to multiply their number. Why do some of you who are doing these tasks of the board of health give up the educational campaign? I asked Miss Acton—you know her paper last year was really a mirror of our actual doings—what effect it had, and she said, "So little that you can say it all over again if you want to." She thinks one reason why you do not care for an educational campaign is because you cannot get the money to carry it on. Then tell the public so. Tell the public of the division of work between the public and private agencies indicated by the statutes. Then ask for the money for the much-needed educational work, but don't think you can't get the money until you have tried.

I know a certain district where the death rate from tuberculosis is very high, and where the number of saloons to the population is also very high, and where the housing conditions are extremely poor. At a meeting of the doctors and teachers and representative people, generally, these things were admitted. Then the question came, "What will you do about it?" "Well," they said, "we know the people who own the houses, we went to school with the men who run the saloons; let us ask the city to give us another nurse."

That, ladies and gentlemen, takes us back to a story so old that the only excuse for repeating it is that the situation it fits is still with us. You remember the story of the town that had a precipice. The people used to fall over the precipice, and had to lie bleeding and injured, perhaps for a long time, until somebody came along and took them to the hospital; so the town selectmen met one day and voted that they should have an ambulance wait at the foot of this precipice in order to carry people to the hospital more promptly. It was many years before the town voted to put a fence at the top.

That story is old, but we haven't built that fence yet.

To just simply nurse—it is splendid; but it is having a fire engine without any campaign of fire prevention. It is trying to put out the fire after it has started. It is palliative. It is deserving of all those words that socialists hurl at us. We must get behind to the real facts and causes and the prevention of them. And that must be, it seems to me, the main part of our program; or, if not the main part, at least an always present part. Begin with this essential part of the program, and add to it what you will. Get the facts of your town or city; bring those facts home to the people in every way that ingenuity and love can devise. You are the interpreters of this great pitiable, preventable thing. You remember Trudeau said, "Pity as an emotion passes, but pity as a motive remains." We all should see that this pity in our hearts remains as a motive to bring the story of the suffering we know so intimately to our public constantly; not only in an appeal for more nurses to take care of the people who are sick, not only for hospitals to segregate all the people who are dangerous, but above all to do these things,—prevent danger and prevent disease.

Just in closing, let me repeat a story, for sometimes a story recalls the moral. A lady and her pet dog started on a journey. The lady was fond of the dog and insisted that he should ride with her, but the conductor said that the dog must travel in the baggage car. She said, "Oh, dreadful!" And he said, "Oh, well, I will take him in." But she said, "No, I will take him in myself." So she carried him to the baggage car and tied him up herself. Some time later she asked the conductor, "How is my dog getting on?" "I don't know, madam," he said, "you tied him to a trunk, and the trunk was thrown out at a station fifty miles down the line."

Be careful what you tie to. The most essential thing of all that we should tie to in the whole tuberculosis work, splendid and necessary as all those curative things are, is the great campaign of education which spells prevention.

## ANNUAL REPORT OF THE SECRETARY, MARCH 31, 1916.

### Membership.

At the end of the first year thirty-four organizations were members of the League. At the end of this, the second year, four more have been added to the membership, making the Report instructive. District Nurses' Association, the Middlesex District Nurses' Association, the Leicester Sanitary Society, and the Middlesex Anti-Tuberculosis Society. The total number of schools, churches, and organizations, however,



of two older tuberculosis organizations. These additions bring the membership of the League up to thirty-six, and an effort has been made during the year to have organized anti-tuberculosis work started in several other communities.

### *New Offices and Equipment.*

In February the League and the Boston Association for the Relief and Control of Tuberculosis moved their offices from 4 Joy Street to 3 Joy Street, where they now occupy a larger suite of rooms all on one floor.

A Special Committee, authorized for the purpose by the Executive Committee, has conferred with the Boston Association on the matter of running expenses, with the result that the League is now paying a portion of the rent of these offices and a share of the salaries of the workers. The League has also joined the Boston Association in purchasing a safe, while for its own use it has bought a typewriter and a Parcels Post Exhibit. Through the kindness of the Treasurer and the generosity of the Duthie-Strachan & Company, Inc., a simple system of bookkeeping has been installed.

### *Legislation.*

At the time of our last annual meeting the Legislature was still in session, and it was therefore not possible to make up a final report on the twenty-three bills considered by the Legislative Committee of the League. We can now report that of the twelve bills approved by the League, seven became law, the others being rejected by the Legislature. Of the eleven bills upon which the League took no action five became law and six were rejected.

This year the Legislative Committee has considered forty-two bills. Thirty-two of these have been approved by the Committee, no action being taken on the other ten. The Legislature is still in session, so that it is again not possible to make a final report as to the disposition of the year's legislative bills.

One matter that has been discussed at some length by the Executive Committee, and upon which educational work is undoubtedly needed, is the failure on the part of physicians and others to report cases of tuberculosis, as required by law. A reference to the report of the Recess Committee on Tuberculosis shows that in almost one-fourth of the cities and towns in the state those responsible are exceedingly negligent in this direction. Unless we can enforce the good laws already on the statute books, no amount of new legislation will avail.

### *Red Cross Christmas Seals.*

The accounts of the sale of Red Cross Christmas seals are now all in except from one city, and we are glad to report that 2,231,877 have been sold. This is a gain over last year of 403,895. These seals were sold by one hundred and thirty agents, eighty-five of whom were

Anti-Tuberculosis Societies, District Nursing Associations, Associated Charities, Boards of Health and Women's Clubs. This figure does not include the hundreds of stores, banks, clubs and individuals who sold seals for the agents.

Ninety per cent., or \$20,086.88, is the amount from the sale of seals secured for tuberculosis work in this state. Deducting from this \$586.37 (the amount of expenses incurred in the sale) as reported by the various agencies, we have for use in the state the sum of \$19,500.51.

Seven and one-half per cent. of the proceeds, or \$1,931.48, is for the use of the League, and after deducting the expenses of the League, such as salaries, printing, postage, express, etc., which amounted to \$327.97, we find that the League has a balance of \$1,603.51 to be put into anti-tuberculosis work.

### *Publicity.*

Under the head of publicity we include lectures, and the use of films and slides, and the printing and distribution of literature, such as legislative bills and press bulletins.

### *Literature.*

A circular entitled "Is the Work of the Anti-Tuberculosis Society Finished?" was printed, and about nineteen hundred copies of it distributed. This circular stated in very positive language the continued need of Anti-Tuberculosis Societies as long as tuberculosis exists. The strength of the circular was emphasized by the fact that it was signed by the State Commissioner of Health, the Chairman of the Massachusetts Trustees of Hospitals for Consumptives and the President of the League.

Nine hundred copies of the annual report were sent out, and twelve National Association Press Bulletins, or a total of thirty-three hundred copies, were mailed to two hundred and seventy-five newspapers throughout the State.

One hundred and twenty-five copies of miscellaneous leaflets, some of which were supplied by the Boston Association, were distributed. This literature, with the three hundred and thirty legislative bills, one hundred circular letters on legislation, and letters urging social agencies of various kinds to do all possible to popularize the tuberculosis dispensaries, brings the total distributed up to about 6,655 pieces.

### *Lectures.*

During the year fifteen talks, fourteen of them by your Secretary, were given on Tuberculosis or Open Air Schools in the following places:—Attleboro, Beverly, Braintree, Brookline, Danvers, Framingham, Lynn, Malden, Medford, Provincetown, Quincy, Scituate, Ware, West Newton, and Weymouth, with a total attendance of about three thousand persons.

### *Slides and Films.*

Many of these talks were illustrated with slides loaned by the Boston Association, and on







ical work. Almost on every page the author bewails his lack of familiarity with the practical side of illness, and the slight amount of practical work done in medicine and surgery before a medical degree was obtained. It would be inconceivable to a recent graduate of a good American school that a man could be a full-fledged physician, even without a hospital appointment, and feel so utterly at sea in regard to the common procedures of practical importance as our author does.

It would seem likewise to most American physicians, that the author takes too gloomy a view of the attitude of the patient's family towards the physician in cases that were of extreme severity or ended unfortunately. He graphically describes this in telling of his experience in treating a child desperately ill with pneumonia. He says, "In fact, without seeing the patient, I always unerringly guessed how he was by the expression of Katerina Alexandrovna's eyes, when she opened the front door; if he were worse, her face breathed ill-concealed dislike, if he were better, her eyes beamed on me with infinite tenderness." Probably all physicians have experienced similar occurrences; some families can never forgive the physician who finds out that there is some serious or fatal malady afflicting those that are dear to them. Few medical men will read this book without recognizing some of their innermost thoughts, their fears, doubts, and anxieties in the early years of practice, though it is probable that few have such a pessimistic view of what, after all, are but incidents common to medical practice.

*The Practical Medicine Series. Under the General Editorial Supervision of CHARLES L. MIX, A.M., M.D. Vol. viii. Materia Medica and Therapeutics, Preventive Medicine, Climatology.* Edited by GEORGE F. BUTLER, Ph.G., A.M., M.D., HENRY B. FAVILL, A.B., M.D., and NORMAN BRIDGE, A.M., M.D. Chicago: The Year Book Publishers. 1915.

This eighth volume in the Practical Medicine Series for 1915 deals compactly with the subjects enumerated in its title. The section on materia medica and therapeutics, which constitutes more than half the book, is divided into three parts, dealing respectively with drugs (the therapeutic agents being alphabetically arranged), with extracts of animal organs, bacterial therapy, sera and vaccines and with electricity, Roentgen rays, radium and radio-active substances. The section on preventive medicine by the late Dr. Favill deals with the physician in public health work, with the infectious diseases, with school children and contagious diseases, with industrial and social diseases, with general sanitation and with eugenics. The brief section on climatology by Dr. Norman Bridge deals with certain aspects of climate and dis-

ease. Though somewhat miscellaneous in its content, the volume is of definite value in completion of the admirable series of which it forms a part.

*Infections of the Hand. A Guide to the Surgical Treatment of Acute and Chronic Suppurative Processes in the Fingers, Hand, and Forearm.* By ALLEN B. KANAVAL, M.D., Assistant Professor of Surgery, Northwestern University Medical School; Attending Surgeon, Wesley and Cook County Hospitals, Chicago. Third edition, thoroughly revised. Illustrated with 161 engravings. Philadelphia and New York: Lea and Febiger. 1916.

The present edition of this well-known book is to be welcomed by the entire surgical profession. The form and outline are unchanged, but certain additions have brought the number of pages up to 500. There are two new chapters: The first, "Relation of Acute Infective Processes to Industrial Pursuits," by Dr. Harry E. Mock; the second, "Plastic Procedures Instituted for the Correction of Deformities."

Dr. Kanavel's book is practically beyond anything except the most favorable criticism. To each of the more extensive of the 29 chapters, he has added a brief résumé. If it were not for this, one might possibly feel that the book is a little too long; that 500 pages upon infections of the hand alone might be apt to keep the average student from that very thoroughness of study upon which Dr. Kanavel properly insists. A careful examination of the book, however, shows that it covers, for all practical purposes, not only infections of the hand, but also infections of the forearm. Furthermore, the statistics from industrial sources show not only that infections of the hand are extremely common, but that their sequels are very serious and together they form an unexpectedly large proportion of the disabilities due to accidents in the working classes. When these two facts are considered, together with careful records of cases and their final results, it becomes evident that the book is not too large.

Dr. Kanavel brings to his task enthusiasm, enormous industry, careful observation, extensive clinical experience, anatomical investigation, and finally, the follow-up system, which, taken altogether, make his book an ideal one-man treatise.

The question which sometimes bothers the reviewer brought face to face with the steadily increasing number of textbooks, "why was this textbook undertaken?" can never arise in relation to this volume. It was undertaken to add to the existing knowledge of an important aspect of surgery, and it has been most successful in achieving this end.

Every advanced student and every surgeon should have it close at hand.



# THE BOSTON Medical and Surgical Journal

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ERNEST GREGORY, Manager,

126 Massachusetts Ave., Corner Boylston St., Boston, Massachusetts.

## INDUSTRIAL HEALTH INSURANCE.

THE brief for health insurance, published in this number, may well be called timely, in that the matter is one on which medical men should be informed, whatever their attitude as to the desirability of such form of insurance. This is particularly important in view of the fact that if such insurance is to come, it is incumbent on the profession to see that its own rights and privileges are not too much abridged. There is an advantage in working under an insurance act, because payments are assured, and not at the whim of the wage-earner, as is so often the case today. There is, however, a danger that compensation will be placed too low; a still greater danger that the administration of the act will make the practice of medicine in industrial communities far less comfortable and satisfactory for the doctor, and the relation of patient and family physician is necessarily going to be somewhat modified and interfered with.

A committee of the Massachusetts Medical Society, appointed last June, has been working with this end in view. If such legislation is to be passed, it is essential that the medical side of it should be considered. Mr. Andrews' communication tacitly recognizes that there is a medical side, but pays no attention apparently to the necessity of considering this side. The danger in any legislation of this sort is that the economic theorist figures on the broad principles involved and is likely to seek legislation along the lines of the best broad theory, without stopping to figure who is hit or how the people, who have the work to do, are going to be helped or hindered in doing it.

It is just for this reason that it is important not only that there should be a committee, but that the mass of the profession as a whole should be informed and ready to do what they can to see that no mistakes are made. This is true whether the individual thinks that this sort of social insurance is moving in the right direction or not. Those who are best qualified to judge seem to feel that some legislation of this sort is bound to come; perhaps not this year, but within a few years. If the medical profession do not look out for themselves in the matter, it is pretty certain that no one else will look out for them.

## THE RÔLE OF THE STATE TUBERCULOSIS SANATORIA.

THE word "sanatorium" coming from the Latin *sanare* (to heal), implies that at such an institution active efforts are made to cure, or at least to arrest, the disease. It is, likewise, proper to infer that at a real sanatorium only those patients are admitted who are in the curable stages of the disease and who offer fair prospects of permanent arrest of the pulmonary process.

Ever since its foundation, the Richard State Sanatorium has been reserved for patients in the early, favorable and unprogressive stages of the disease. Patients who are in the advanced stage of the disease, or in the process of relapse, are not admitted. The medical staff of the sanatorium is composed of a large number of physicians, and the treatment is of the most modern and scientific. The sanatorium is situated in a beautiful spot, and the climate is ideal for the treatment of the disease. The patients are given the best of care, and the results are most satisfactory. The sanatorium is a place where patients can find rest and recovery, and where they can be cured of their disease.



this period. If, at the end of this time, he is found to be in the advanced or progressive stages of the disease, or in any other ways, he is not considered a suitable patient for this particular institution, he is transferred to another sanatorium or sent elsewhere. Thus the condition of affairs, as far as the Rutland State Sanatorium is concerned, although not yet entirely satisfactory, is at least fairly so, and one that is constantly improving.

This is not altogether the case with the three remaining State sanatoria, at North Reading, Lakeville and Westfield. In many ways these three institutions, which were opened in the years 1910 and 1911, are vastly better suited for the care and treatment of patients in the early stages of tuberculosis than is the case at Rutland, which was built in 1898. At the time they were opened, however, the incipient consumptive could be cared for fairly well at Rutland, while there were practically no accommodations for that most pathetic and dangerous of cases,—the advanced consumptive. As a result, beds at these newer sanatoria were at once filled with patients, most of whom were in the advanced stages of the disease. It was not intended by the Board constructing these three institutions that they should be homes for advanced and incurable consumptives; yet because of certain unavoidable circumstances which led to the immediate admission of many patients of this class, they have come to be looked upon as places where patients in any stage of the disease can go and receive treatment. This is an unfortunate state of affairs, and one which, to a large extent, defeats the very end for which these sanatoria were planned.

At the present time, there is a large number of beds in local tuberculosis hospitals intended for sick and advanced consumptives, while, in addition a bill has been passed and definite appropriation made for county tuberculosis hospitals, which will provide beds for those communities without local tuberculosis hospitals of their own. There would seem to be, therefore, no reason why the North Reading State Sanatorium, the Lakeville State Sanatorium, and the Westfield State Sanatorium should not fill the rôle for which each was originally intended, *i.e.*, an institution where tuberculous patients in the curable, though not necessarily incipient, stages of the disease could receive active and aggressive treatment. At these institutions no line is drawn at the word incipient. At Rutland every

effort is made to admit only those patients who are really in the first stage. At the other sanatoria, this distinction is not drawn, the sole qualification being that the patient should be considered capable of ultimate arrest or, at least, of marked improvement.

It is to be hoped that the medical profession of this State will realize the wisdom of this viewpoint, and will coöperate in every way with the superintendents of these institutions and the board of trustees, so that municipal and county tuberculosis hospitals will be used more and more for the advanced, progressive and dying consumptive, leaving our four State sanatoria to play the part in the tuberculosis campaign originally assigned to them.



### PROGRESS OF POLIOMYELITIS.

DURING the past week the epidemics of poliomyelitis have continued to increase in Massachusetts and to decline elsewhere throughout the country. In New York City on October 6, the number of cases reached a total of 9118, with 2321 deaths. In New York State, outside New York City, the total number of cases on September 26, was 3301, with 589 deaths, and in New Jersey on the same date, 3571. On September 18 the number of cases in Pennsylvania reached a total of 1308; in Minnesota, 669; in Connecticut, 789, and in Illinois, 563.

In Massachusetts 198 new cases of poliomyelitis were reported during the first seven days of October, making a total of 1215 in this State since January 1. During 1915 there were only 135 cases reported. There were 151 in 1914, 361 in 1913, 169 in 1912, 232 in 1911, 845 in 1910 and 923 in 1909. Of the total number of cases in the present epidemic, 245 have been in Boston. In this epidemic thus far there have been 150 deaths, of which 16 occurred in July, 39 in August, and 95 in September. There have been 284 cases in Boston and 82 in Holyoke.

In last week's issue of the JOURNAL we noted editorially the organization of the Harvard Infantile Paralysis Commission to conduct research into the transmission and treatment of poliomyelitis, and to constitute a clearing-house for the collection and free distribution of therapeutic blood serum. At the close of the first week of its activity, this commission issued the following report of its work:



"The commission has assisted in the diagnosis and treatment of 20 cases. The serum obtained from the blood of those who have recovered from the disease in the past has been given in 14 cases. Of these, two, who had been ill for some time, died; four were paralyzed before the serum was given, and of the remaining eight, who were given serum in the earliest stages of the disease, none has as yet developed paralysis. These results are encouraging for the use of serum in the earliest stages of the disease.

"Too much emphasis cannot be laid upon the fact that beneficial results from the use of serum can be hoped for only when it is given in the very earliest stages of the disease, and before the evidence of even the slightest paralysis appears. The experts of the commission are on call day and night at the Harvard Medical School to respond to requests from physicians for assistance in the early diagnosis of the disease and for administering serum, if desired. The serum and the services of the diagnosticians are furnished free of charge by the Harvard Commission.

"More serum is urgently needed if the commission is to respond to all the demands made upon it. In the first week 15 persons have volunteered and permitted the required small amount of blood to be taken from them by a process which is without the slightest danger. The commission will gladly pay the traveling expenses of those who wish to volunteer and will come to the Harvard Medical School."

On October 3, Dr. Linsley R. Williams, of Albany, New York, deputy state commissioner of health, announced that the New York State Department of Health had organized a comprehensive plan of after-care for survivors of poliomyelitis throughout the state. Outside of New York City these number 2712. To establish and administer the details of this work, Dr. Robert W. Lovett, professor of orthopedic surgery at the Harvard Medical School, has been appointed. In addition, he will conduct clinics at various places in every county of the state, and will disseminate instruction relative to re-education of paralytics. Dr. Armitage Whitman of New York City, and Dr. John P. Hodgins, of Boston, will be associated with Dr. Lovett, and will devote their entire time to the work.

### COLUMBUS AND SYPHILIS.

A PARTICULAR pertinence attaches to the publication, as the leading article of the present issue of the JOURNAL, on Columbus Day, of Dr. Downing's scholarly paper on the question of the American origin of syphilis and its impor-

tation into Europe by the returning sailors of Columbus. Whatever the ultimate decision on this point, his article directs attention to an interesting and important topic of medical epidemiologic history, and to the classic contribution of Fraeacstor, which should be familiar to physicians as the beginning of the literature of this disease.

### MEDICAL NOTES.

AMERICAN HOSPITAL ASSOCIATION.—The eighteenth annual meeting of the American Hospital Association was held at Philadelphia, on September 26 and 27, under the presidency of Dr. Winfield H. Smith, superintendent of the Johns Hopkins Hospital, Baltimore. In his presidential address at the opening session, Dr. Smith discussed the subject of political domination of the administration and staff appointments of municipal hospitals.

MENTAL DEFECTIVES IN THE DISTRICT OF COLUMBIA.—The Children's Bureau of the United States Department of Labor has recently investigated the subject of feeble-mindedness in the District of Columbia. Of the 33,000 inhabitants of the district, there are about 1500 insane, and in addition, 798 feeble-minded. Of these feeble-minded, 97 were in appropriate institutions, 249 in inappropriate institutions, and 452 were not in institutions.

YELLOW FEVER IN SOUTH AMERICA. Report from New York states that, on September 26, Dr. William C. Gorgas and four other members of the Rockefeller Yellow Fever Commission, of which he is chairman, returned to the United States aboard the steamer *Bravo* from Porto Rico after a tour of inspection through Ecuador, Peru and Colombia. The commission reports that yellow fever was found in only one of the ports visited, namely, Guayaquil, Ecuador, where the disease has been endemic for the past fifty years, and the deaths from it average 35 a month. On October 7 the commission again sailed from New York for Rio Janeiro, Manaus, Pernambuco and Bahia.

PIERAGE FOR A CANADIAN PHYSICIAN. It was announced in the *London Gazette*, under date September 8, 1916, that Dr. Gervase Percy Alexander, Esq., had been appointed to the House of Lords under the title of Baron of Colham. This action represents the award of the ancient barony of Colham to a Canadian physician. This barony, of which there should not be confusion with the barony of Colham, was suspended in 1603. Alexander, Dr. Gervase Percy Alexander, Esq., has recently died, and the title has been passed on to a new peer.



"As long ago as 1912 the proceedings took place before the committee of privileges, which resulted in the calling out of abeyance of the Baronies of Strabolgi, Burgh and Dudley, and the restoration of the Barony of Cobham. It was in 1487, 1322 and 1313 that the three former peerages were created by writs of summons, and they became united in the person of a Lord Burgh, who died in 1597, leaving four daughters, his eventual coheirresses, amongst whom the titles fell in abeyance. The petitioners claimed to be the representatives of one of the daughters. The last holder of the three baronies was the Lord Cobham who was attainted of high treason in 1603, and died before 1606. He was the tenth baron, and before the committee of privilege it was shown that Henry de Cobham was summoned by writ as a peer in 1313."

**CHANGES IN COST OF DRUGS.**—Report from New York on September 29 notes the following recent changes in the cost of drugs.

"Sharp advances occurred in denatured and wood alcohol, owing to an increase in domestic and export trade. Sales of muriate of potash were reported at a further material rise.

No new features developed in the opium situation. There was seemingly no improvement in the demand from domestic buyers, but the market remained steady at the late advance to \$11 per pound for gum. Powdered and granular were unchanged at \$11.70 and \$11.85 per pound, respectively.

Denatured alcohol was higher. Demand for domestic and export account has increased recently, and leading distillers announced an advance in prices of five cents per gallon to 55 and 57 cents, according to quantity, the inside figure being for carloads.

Wood alcohol was also advanced five cents per gallon by leading distillers to 70 cents per gallon for 95 per cent., and 75 cents for 97 per cent in carloads.

Glycerine was advanced by leading Eastern refiners to 44 cents per pound for chemically pure in drums."

**DECLINE OF THE ENGLISH BIRTH RATE.**—The British National Council of Public Morals appointed in 1913 a commission to investigate the causes of the declining British birth rate, and to make recommendations upon means for combating them. This commission has recently issued its report. After reviewing the evidence of vital statistics and testimony, the commission postulates the following propositions which it considers to be definitely established.

"1. That the birth rate has declined to the extent of approximately one-third within the last thirty-five years.

2. That this decline is not, to any important extent, due to alterations in the marriage rate, to a rise of the mean age at marriage, or to other causes diminishing the proportion of married women of fertile age in the population.

3. That this decline, although general, has not been uniformly distributed over all sections of the community.

4. That on the whole, the decline has been more marked in the more prosperous classes.

5. That the greater incidence of infant mortality upon the less prosperous classes does not reduce their effective fertility to the level of that of the wealthier classes.

On the economic and social aspects of the subject the commission drew attention to the argument that an improvement in the birth rate would be facilitated by such conditions as greater security and regularity of income, with adequate insurance against unemployment among all ranks of workers. This view, they point out, is not supported by the statistical evidence available. Not only do the better-to-do classes restrict more closely the size of their families, but even among certain of the wage-earning classes the birth rate varies inversely with the income.

In a section of the report dealing with the housing question, the commission put on record their opinion that both in town and country the present state of things makes the rearing of large families by the working classes a matter of great difficulty and has an effect upon the birth rate. Other sections deal with the medical aspects and the moral and religious aspects of the subject.

An addition to the report is signed by twenty-four members, who are of opinion that something more will be expected from the commission. They deal with two questions:

(1) Is the present decline of our national birth rate regrettable?

(2) If it is regrettable, is it preventable, and if so, how?

The signatories set out reasons why they consider an increase of the population desirable, so far as it is consistent with improvement. They point out that with more intensive culture of the land this country could satisfactorily support a larger population, and that this possibility is much extended if we take into account the whole British Empire. A number of proposals, many of them of an economic character, are also put forward for consideration as tending to further the object in view. They include a living wage, bonuses for families under certain conditions, relaxation of the income-tax arrangements, increased facilities for good education, adequate housing accommodation at reasonable rents, and measures to encourage the full development of natural resources both at home and in the Dominions beyond the seas."

#### EUROPEAN WAR NOTES.

**AMERICAN MOTOR AMBULANCES IN RUSSIA.**—Report from Petrograd states that, on September 25, a fleet of fifteen motor field ambulances, presented by a group of Americans to the Russian government, was formally accepted by the



Empress Alexandria and the Grand Duchess Tatiana. The presentation was made by Captain Philip Lydig and Dr. Philip Newton, under whose command the cars were sent to the front on September 26.

**WAR RELIEF FUNDS.**—On Oct. 7 the totals of the principal New England relief funds for the European War reached the following amounts:

Secours National Fund .....	\$214,669.17
French Wounded Fund .....	124,277.70
French Orphanage Fund .....	65,431.85
British Imperial Fund .....	65,277.00
Surgical Dressings Fund .....	48,020.45

#### MEXICAN NOTES.

**RETURN OF FIELD AMBULANCES.**—On September 25 the First Massachusetts Field Ambulance, and on September 26, the First Rhode Island Ambulance Company, returned from the Mexican frontier to their respective homes.

**SICK AND DEATH RATES AT THE FRONT.**—Report from Washington, D. C., on September 26, states that during the week ended September 23 the morbidity rate among troops of the National Guard at the Mexican frontier was 2.38, with six deaths, as against 2.13 and five deaths for the week ended September 16. The corresponding figures among regular troops were 2.53 with seven deaths, and 2.63 with two deaths.

#### BOSTON AND NEW ENGLAND.

**THE WEEK'S DEATH RATE IN BOSTON.**—During the week ending Oct. 7, 1916, the number of deaths reported was 209, against 216 for the same period last year; with a rate of 14.33, against 15.05 last year. The number of deaths under 1 year of age was 34, against 48 last year; and there were 62 deaths aged over sixty years, against 57 last year.

The number of cases of principal reportable diseases were: diphtheria, 33; scarlet fever, 9; measles, 3; whooping cough, 6; typhoid fever, 10; tuberculosis, 56.

Included in the above were the following cases of non-residents: diphtheria, 7; tuberculosis, 4; scarlet fever, 3.

Total deaths from these diseases were: diphtheria, 2; whooping cough, 1; typhoid fever, 3; tuberculosis, 11.

Included in the above were the following deaths of non-residents: typhoid fever, 1; tuberculosis, 1.

**NEW ENGLAND ASSOCIATION OF JEFFERSON MEDICAL ALUMNI.**—The tenth annual meeting of the New England Association of the Jefferson Medical College Graduates was held at Hartford, Conn., Tuesday, September 19, 1900 being present. The banquet was held at the Country Club at Farmington, at 8 p.m., transportation being provided by auto from Hartford by Dr. Eckley R. Storrs, vice-president. The opening address was made by Vice-President Storrs, and the reports of the secretary

and treasurer were read and accepted, and the following officers elected for 1917: president, Eckley R. Storrs, Hartford, Conn.; vice-president, Albert C. Getchell, Worcester, Mass.; treasurer, Frank I. Payne, Westley, R. I.; secretary, Wallace P. MacCallum, Boston, Mass. The party then adjourned to the banquet hall, where Dr. J. W. Felt, of Hartford, acting as toastmaster, introduced the following speakers, with these subjects: Address of Welcome, Hon. F. A. Hagarty, Mayor of Hartford; "Jefferson and Its Relation to Amalgamation," Prof. Edward Parker Davis, Jefferson Medical College, Philadelphia; "Foilables in Medicine, from an Insurance Standpoint," W. G. Cowles, Esq., Travellers' Insurance Company, Hartford; "Hartford's New Water System," Caleb M. Saville, C. E., Hartford; "Things That I Have Heard about Doctors," William H. Worrell, Ph.D., Professor of Arabic, Hartford Theological Seminary. After brief talks by Dr. George L. Porter, 1865, of Bridgeport; John T. Farrell, M.D., of Providence, R. I.; James A. Mansfield, M.D., of Boston; and Charles A. Riley of Boston, the party adjourned. It was voted to hold the next annual meeting at Worcester, Mass.

**INSANITY IN MASSACHUSETTS.**—According to the recently issued seventeenth annual report of the State Board of Insanity, covering the year ended November 30, 1915, there were 18,137 people under its care, being 1 such person to every 203 of the population of the State. Of this number, 14,746, or 81%, were insane; 2604, or 14%, feeble-minded; and 619, or 3%, epileptic (same). Their increase for the year was 833. The whole number of such persons under public care was 17,702, under private care, 435. The increase of such persons under public care for the year was 844, their average annual increase for the last five years, 596. The nativity of first cases of insanity does not differ materially from the percentages of the previous year. Exclusive of 37, or 1.17%, whose birth-places were unknown, 1241, or 39.90%, were born in Massachusetts; 1522, or 18.93%, in New England; 1692, or 54.41%, in the United States; and 1418, or 45.59%, in foreign countries.

**TYPHOID FEVER IN BOSTON.**—A recently published monthly bulletin of the Boston Health Department shows that during the first eight months of 1916 only twelve deaths from typhoid fever occurred in this city, the lowest number on record for that period since 1896. In 1915 Boston had the lowest typhoid mortality of any large American city, only one death occurring. "This rate will place Boston at the head of the large European cities, which have averages 1, London, Berlin, 1.5; Vienna, 2.1; Hamburg, Christiania, 2.5; Stockholm, 3.0; and Copenhagen, 3.5."

"We have but to look at the figures of the



to realize the great decrease that has taken place in deaths from typhoid fever in this city. In 1908 there were 158 deaths from this disease, in 1914 there were 66, in 1915 only 40, and thus far this year but 12. During the period between 1906-10 the death rate from typhoid fever was 16.0, in 1914 it was 9.2, last year 5.3, and this year it is hoped that it will not exceed 2.5."

**NEW CLINIC AT BOSTON DISPENSARY.**—On October 2 a new combined clinic for the treatment of diseases of the nose, throat and ear was opened at the Boston Dispensary. It was formed by uniting the previous separate departments for diseases of the ear and of the throat. The new department will be under the direction of Dr. Frederic C. Cobb, with whom will be associated Dr. William E. Chenery, Dr. W. S. Boardman, Dr. Edward R. Newton and Dr. Henry J. Inglis.

**WALTHAM TRAINING SCHOOL.**—The annual graduation exercises for the Waltham (Mass.) Training School for Nurses were held in that city on September 29. The principal address was made by Dr. Charles F. Painter, and diplomas were awarded to a class of thirteen pupil candidates.

**HEALTH WORKERS OF NORTHEASTERN MASSACHUSETTS.**—A regular monthly meeting of the Association of Health Workers of the Northeastern District of Massachusetts was held at Everett, Mass., on September 28, under the auspices of the local Board of Health, and was attended by over three hundred members and guests. The chief topic of the meeting was the prevention of tuberculosis among predisposed children.

Dr. Thomas Harrington, deputy commissioner of the State Board of Labor and Industries, spoke on 'School Hygiene.' He advocated open-air schools, or at least an open-air schoolroom for children predisposed to tuberculosis. He urged that school hygiene should be taught as a necessary step to a successful fight against tuberculosis.

Dr. Richard M. Smith of Boston spoke on 'Tuberculosis in Childhood,' and urged early diagnosis of suspected cases. Dr. John A. Brewin of the Everett Board of Health talked on the problems of the local campaign.

An illustrated health talk was given by Dr. Lyman Asa Jones, director of the division of hygiene of the State Department of Health. 'The Tuberculosis Dispensary System' was the subject of Dr. Eugene R. Kelley, and Dr. Arthur A. Brown, State district health officer, spoke on the problems of the Northeastern district.

The next meeting of the Association is to be held at Newburyport, Mass., on November 9.

**THE FAULKNER HOSPITAL, JAMAICA PLAIN, MASS.**—The twelfth annual report of the Faulkner Hospital, which covers the year ended May

1, 1916, announces a legacy of \$8,000 from the estate of Frances G. Curtis. This is to be held as a fund for maintaining a free bed, the second memorial bed thus far given to the hospital. The nucleus of a fund for another free bed has been started by friends of the hospital in West Roxbury. The most notable feature in the work of the hospital is stated as being the growing demand for maternity service. The building of a maternity ward was seriously considered a year ago, and this year the trustees have voted to erect such a building, and the necessary appropriations have been made. Some of the rooms in the new building intended for patients will, however, have to be used for nurses until funds can be secured to provide additional accommodations for them. Seven nurses were graduated from the training school during the year. It is hoped that it will be possible at an early date to provide a social worker for the hospital in order that intelligent treatment and care can be continued to many patients who are in need of such attention after they leave the hospital.

## Miscellany.

### THE SANITARY PROGRESS AND VITAL STATISTICS OF HAWAII.

In a pamphlet compiled by Frederick L. Hoffman, LL.D., statistician, and issued by the Prudential Insurance Company, is contained a detailed account of the sanitary condition and progress of Hawaii from the time of its discovery by Cook in 1778 to the present day. Physically of a superior type, the native Hawaiians present an interesting study of the effect of civilization and its attendant diseases on a primitive people. Syphilis, according to one authority, was unknown in the islands before the visit of Cook in 1778, but in 1839 the disease was excessively prevalent and malignant. Leprosy is mentioned as having been unknown until about the year 1840, when it is believed to have been introduced by Chinese immigrants. In 1890 the number of lepers segregated at Molokai was 1213, but this number was by no means considered as representative of the full extent of the evil. Smallpox was first introduced in 1853, from San Francisco, and in eight months the disease carried off 8% of the population. The introduction of tuberculosis, and its rapid spread among the native races of the Southern Pacific, according to numerous authorities, dates from the time of the settlement by the Europeans, when the natives were induced to make considerable changes in their mode of life.

As recently as 1872, an official census gave the number of full-blood Hawaiians as 49,044, and only 2487 mixed-bloods of part Hawaiian







many years in preparing herself for this work. In many cases the school attendance has been interrupted before coming to the hospital, and many children here for treatment or other ailment may be defective. Much of the teachers' work is individual along lines of special schools for backward and slow-developing children.

"Children between two and fourteen years of age are admitted to the hospital at any time, no commitment being necessary. All cases are admitted upon the voluntary application of those who are responsible for their care and support. Parents or guardians do not relinquish their rights or responsibility for them further than their care, treatment and training for the time being. Any case may be received without formality if the support of the child has been provided for as to the weekly cost of same. Application blanks and further information may be obtained upon request by addressing the superintendent.

"A certain number of charitable cases are taken, where only part of the expense can be covered by the parent, and a special charity rate of \$3.25 per week has been established for board, care and treatment through the Commonwealth for suitable cases dependent upon the State or city for support.

"The average weekly per capita cost has been \$6. For those outside of Massachusetts the rate is seldom less than cost. If private nurses or any extraordinary attention is required, this charge is graded to fit conditions.

"The income from invested funds now amounts to almost \$340,000, which we hope will be increased to a million dollars before long, as in this way we may be able to care for a greater number of charitable cases, and the contributions of charitable people, the Woman's Board, and others, make it possible to offer rates below cost, as low as \$3.25 per week. In cases unable to pay more, children may often be supported by some society organization of their own community, a written agreement for support being required. As the hospital is supported largely by voluntary contributions, donations of all kinds are earnestly solicited. Funds of smaller or larger denominations are accepted. A free bed can be maintained by an annual payment of \$200. An endowment of \$5000 will maintain a free bed permanently. We now have ten free beds. This applies to patients within the State. For those outside the State, \$10,000 at least will be necessary. Notice of a desire to establish a free bed may be sent to the superintendent of the hospital or to any other officer of the institution.

"All kinds of bed linen, furnishings and hospital equipment and appliances for deformed infantile paralytic children are needed, as well.

"We hope to increase our funds to secure a new operating room and x-ray room, a workshop for making all appliances for the deformed children, a plaster room, also an industrial room

which should be fully equipped, as well as playthings to establish a play pavilion for all the children.

"We hope that the many friends of the hospital may help by the solicitation of others, who can help so much to bring sunshine and happiness to those who have been unfortunate through accident and disease."

## OCCUPATION AND HEALTH IN ADOLESCENCE.

It is so well recognized that certain occupations may involve serious dangers to young, growing persons that most States now have their child labor laws. Massachusetts, which has been a leader in legislation of this character, is now engaged in a systematic effort to collect information that may be of value in determining the need of changes in its present laws and regulations governing the employment of minors. At the request of the Massachusetts Board of Labor and Industries, Assistant Surgeon M. Victor Safford of the United States Public Health Service was detailed by the Federal Government to cooperate with the State authorities in a study of the effect of employment in various occupations on the health and physical development of children now permitted by law to work therein. A report of this study with respect to the cotton manufacturing industry of Massachusetts has just been published by the Federal Government as Public Health Bulletin No. 78, entitled "Influence of Occupation on Health During Adolescence."

The physical condition of over 600 boys between the ages of 14 and 18 employed in this industry in different parts of the State received careful study. It was brought out that in Massachusetts, boys between these ages, for the most part, do not remain long in the cotton mills. This fact and the strict regulations of the State governing the employment of minors may not make some of the conclusions reached in this local investigation equally true elsewhere, but among the facts disclosed, the following may be mentioned:

A considerable proportion of the younger boys, and also of those over sixteen, were undersized and physically undeveloped for their ages, while those between fifteen and sixteen averaged larger than other classes of boys of their age with which comparisons were made. This fact is explained by the accumulation in the mills of strong boys waiting to reach the age of sixteen to go into permanent "full time" occupations. The presence of a noteworthy proportion of undersized boys is not ascribed to the effects of the occupation, but to the fact that the cotton mill offers one of the few chances of employment for undersized boys. Evidence of injurious effects of their work or working conditions, even of the temperature and humidity of the mills, on normal boys, was seldom found, although further



investigation of possible effects of atmospheric conditions is recommended. Probably as a result of the State regulations relative to the issuance of employment certificates comparatively few cases of dangerous diseases were discovered. There was, however, a wide variety of defective conditions disclosed by the investigation, many of them of such a character as to impair seriously the future health and economic usefulness of the individuals concerned, if not remedied.

### HEALTH INSURANCE.

TWENTY-FIVE out of every 1,000 employees in American industries, according to recent statistics, are constantly incapacitated by sickness, the average worker losing approximately nine days each year on this account. This "non-effective rate" for the great army of industrial workers in the United States barely suggests the total money loss to employers and employees. The lessened efficiency, the effects of reduced earnings in times of sickness, as well as the cost of medical attention, and the economic loss from deaths, swell the cost to industry and to the Nation to almost incalculable figures.

That much of this loss is nothing less than preventable waste, and that this waste can be largely reduced by a properly conducted system of governmental health insurance for wage-workers, are conclusions set forth in Public Health Bulletin No. 76, containing the results of a study of "Health Insurance—Its Relation to the Public Health," just issued by the United States Public Health Service.

The preventive value of health insurance is given especial emphasis in this study. "Any system of health insurance for the United States or any State should at its inception have prevention of sickness as one of its fundamental purposes," says the bulletin. "This country should profit by the experience of European countries, where prevention is being recognized as the central idea necessary to health insurance if health insurance is to attain its greatest success in improving the health and efficiency of the industrial population."

Such a system, it is pointed out in the bulletin, would:

1. Provide cash benefits and medical service for all wage-earners in times of sickness at much less cost than is now possible. Adequate medical relief would thus be placed within the reach of even the lowest paid workers, who are most subject to ill-health.

2. Distribute the cost among employers, employees, and the public, as the groups responsible for disease-causing conditions, and afford these groups a definite financial incentive for removing these conditions. This can be done by means of small weekly payments from employees, supplemented by proportionate contributions from employers and government at a

rate reducible in proportion to the reduction of sickness.

3. Become an effective health measure by linking the cooperative efforts of the three responsible groups with the work of National, State and local health agencies, and by utilizing these agencies in the administration of the health insurance system.

4. Afford a better basis for the cooperation of the medical profession with public health agencies.

5. Eliminate the elements of paternalism and charity-giving by making employees and the public, as well as employers, joint agents in the control of this fund.

"A governmental system of health insurance," concludes the study, "can be adapted to American conditions, and when adapted will prove to be a health measure of extraordinary value."

### AN INSTANCE OF MEDICAL HEROISM.

At the closing exercises of the fourteenth session of the United States Naval Medical School, at Washington, D. C., on April 12, 1916, the commencement address, on "The Humanity of Surgery," was delivered by Dr. Hubert A. Royster, of Raleigh, N. C. It contained an account of heroism on the part of the doctor deserving of note in the annals of his profession.

"Surgeons everywhere have been called upon to perform services of the most heroic kind, and, he it said to their credit, they have been found, for the most part, sufficient for their tasks. Even in civil life examples are not lacking. My own state presents an instance of the highest type in the person of Edmund Strudwick, who by one deed would have the title of hero. Not in all the annals of history have I read of nor is it in my mind to conceive of firmer devotion to duty or of more daring fortitude than he exhibited. When near sixty years of age, he was called to a distant county to perform an operation. Leaving on a 9 o'clock evening train, he arrived at his station about midnight, and was met by the physician who summoned him. Together they got into a carriage and set out for the patient's home six miles in the country. The night was dark and the road was rough; the horse became frightened at some object, ran wild, upset the carriage and threw the occupants out, striding off. The country doctor, who had been forwarded word by mail of the accident, was called to the scene and found Dr. Strudwick's leg just above the ankle. As soon as he had sufficient strength to get up, he called aloud for help, and the physician, who had crawled to the spot, found him lying on the ground, his leg crushed. The physician, who had been summoned to the house, where he found the patient, and the



of himself or of his companion; but, coming out of his stupor, he faintly remembered the occurrence and at once dispatched a messenger to the scene of the accident. Dr. Strudwick was still leaning against the tree, calling now and then in the hope of making some one hear, when the carriage came up about sunrise. He got in, drove to the house, without allowing his own leg to be dressed, and, sitting on the bed, operated upon the patient for strangulated hernia with a successful result. 'Greater love hath no man than this.' "

The daily heroism of the physician in encountering the incidental risks of his profession is frequently exaggerated; but such conduct as that of the above incident demands a degree of physical fortitude seldom observed except under conditions of war.

### Correspondence.

#### A REJOINDER ON WORKMEN'S COMPENSATION.

*Mr. Editor:* I wish to make some criticisms of statements in an article in your last issue above the signatures of M. A. Tighe, M.D., and J. A. Mehan, M.D.

When these gentlemen say: "We believe that any act which deprives John Smith, a human being, of his divine right to select his attendant, when either accident or sickness befalls him, is grossly unfair,—no matter who pays the bill,"—I cannot believe they mean or believe what they say. The law specifically states that he shall select only attendants of certain qualifications and holding certain licenses, and if John Smith, paying his own bills, an honest believer in Christian Science or Osteopathy, should select one from these cults as an attendant on one of his family ill with diphtheria or typhoid fever, he would find himself and his attendant in trouble with the law. And the law that would abridge his liberty is an offspring and creation of our medical organization.

These gentlemen also state, "The service offered by the Insurance Associations is positively no better than the workman himself could and would select." This may or may not be true. It cannot be proven or disproven, and it would be idle and unprofitable to discuss it. When the Workmen's Compensation Act compels the employer to care for the workman injured in his employ, it seems but common justice that the employer himself, or through the Insurance Company paying the bills, should have the right, at least, to insist that the injured should be treated only by competent, experienced surgeons, and I think that if these gentlemen were employers, instead of physicians, they would see it in that light. There is no sentiment with Capital; and the employer or the Insurance Company do not select a surgeon because of race, creed, affability or friendship. With them it is a matter of cash results. Their only interest is to see that the injured workman recovers as soon as possible, with the least possible permanent disability, and when, as has recently occurred, a workman with a comparatively trivial injury dies after a long and painful illness from seeming neglect, incompetency, or inexperience on the part of his attendant, the company, in justice to themselves and to their injured workman, should have the right to debar this surgeon from further service in their employ.

A patient in a hospital generally accepts the service of the medical and surgical staff in that hospital without a sense of hardship. If, for personal or

other reasons, he prefers someone outside of that staff, he is at liberty to avail himself of that other service, providing he is willing to pay for it. Where are the cases dissimilar?

A too zealous insistence on regulating the relations between the medical profession and society at large has often brought our profession into disrepute from the days of Molière down to the present time.

WILLIAM G. REED, M.D.,  
September 29, 1916. Southbridge, Mass.

#### APPOINTMENTS.

BOSTON CITY HOSPITAL.—DR. JOHN G. BRESLIN has been appointed assistant resident surgeon of the Haymarket Square Relief Station, and DR. BERNARD F. DEVINE resident surgeon of the East Boston Relief Station.

BOSTON DISPENSARY.—DR. MAYNARD LADD has been appointed physician-in-chief of the Children's Department of the Boston Dispensary.

TUFTS MEDICAL SCHOOL.—DR. ANDREW H. RYAN has been appointed professor of physiology, DR. CHARLES H. BAILY associate professor of histology, and DR. ARTHUR L. CHUTE associate professor of surgery.

UNITED STATES CENSUS BUREAU.—DR. WILLIAM H. DAVIS, for some years vital statistician of the Boston Health Department, has been appointed chief statistician of the division of vital statistics of the United States Census Bureau.

#### SOCIETY NOTICE.

WORCESTER DISTRICT MEDICAL SOCIETY.—The regular meeting will be held in G. A. R. Hall, 55 Pearl Street, Worcester, at 4.15 P.M., Wednesday, October 11, 1916.

#### PROGRAM

I. Obstetrical Preparedness, by Dr. Charles M. Green, of Boston.

II. Report of Committee to the "First Legislative Convention of Massachusetts Physicians." All members interested in the Workmen's Compensation Act should be present to discuss and act on the report. Attorney Frank F. Dresser will tell us something of the legal aspects of the situation and what we may reasonably strive for.

Remember that the censors meet for examinations of candidates on the second Thursday in November. Prospective members should get in touch with the secretary before that day.

ERNEST L. HUNT, *Secretary*.

#### NOTICES.

MASSACHUSETTS GENERAL HOSPITAL, ETHER DAY EXERCISES.—Members of the medical profession are invited to attend the Ether Day exercises in the Moseley Memorial Building of the Massachusetts General Hospital (entrance on Fruit and North Grove Streets), at 4 P.M., on October 16, 1916.

The address will be given by Dr. Haven Emerson, Commissioner of Health, New York City. Subject:—Preparedness for Health.

CARTWRIGHT LECTURES.—The Cartwright Lectures of the Association of the Alumni of the College of Physicians and Surgeons will be delivered at the College of Physicians and Surgeons, 437 West 59th Street, New York, Tuesday and Wednesday afternoons, October 24 and 25, 1916, at five o'clock, by Richard M. Pearce, M.D., Professor of Research Medicine, John Herr Musser Department of Research Medicine, University of Pennsylvania, Philadelphia. Subject:—The Spleen in its Relation to Blood Destruction and Regeneration. The public is cordially invited to be present.

HARVEY SOCIETY LECTURE.—The first lecture of the course for 1916 of the Harvey Society will be given on October 14, at the New York Academy of Medicine, New York City, by Professor J. S. Haldane, University of Oxford, on "The New Physiology."



The Boston Medical and Surgical Journal

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## Massachusetts Medical Society.

PAPERS READ BEFORE THE COMBINED  
MEETING OF THE SECTIONS OF MEDI-  
CINE AND SURGERY. JUNE 7, 1916.

## SYMPOSIUM ON GOITRE.

## I.

## SURGERY OF THE THYROID GLAND.

By C. A. PORTER, M.D., Boston.

THE surgical lesions of the thyroid which we have to consider are infections; simple bilateral diffuse hyperplasia, or hypertrophy of the gland; fetal adenomata; cysts; adenomata, and irregular colloid tumors, often in combination; malignant tumors, sarcomata and carcinomata; and finally, toxic goitres and true exophthalmic goitre or Graves' disease. In infections, we have to do with drainage operations; at times, removal of portions of the gland; in the condition of adenomata, cysts, and colloid goitre, removal of the cyst, enucleation of the tumor or, as in the case of colloid growths, a sufficient removal to relieve obstruction to the trachea, esophagus, etc., or for cosmetic purposes; next, removal of tumors which, owing to their appearance late in life, or rapid growth, suggest the possibility of incipient malignant disease, finally attempt at cure or palliation, *i. e.*, tracheotomy, of actual malignant disease.

Of the goitres with toxic symptoms, so called hyperthyroidism, there are two types; those in which a goitre has been present for varying lengths of time, followed ultimately by toxic symptoms, with or without exophthalmos; and perhaps the *true type* of primary Graves' dis-

ease, in which general toxic symptoms not rarely precede or quickly follow the development of an enlarged thyroid.

1. In many infections there is undoubtedly a process in the thyroid gland which is shown by swelling, tenderness, increased size, fever, leucocytosis, pain—often referred to the back of the ear or neck—difficulty in breathing or swallowing. As a rule, under such conditions the infection spontaneously subsides without the formation of pus. Occasionally a definitely suppurative thyroiditis takes place with pus formation, requiring evacuation on ordinary surgical principles. I have seen a few cases which were diagnosed as ordinary deep cervical abscesses. It is not the large venous supply of the gland, pyogenic infection, and the results of proper drainage which prevent suppuration. However, as a rule, the acquired toxæmia, which develops from destruction of the thyroid glands, which is caused by scar tissue. Tumors of the thyroid gland in syphilis very rarely, if at all, occur in the thyroid gland.



poles are left of symmetrical size in order that one side of the neck may not be smaller than the other.

3. Fetal adenomata occur as single or multiple, nodular, circumscribed tumors in one or both lobes, developing early in life, or at any period. They lead often to marked deformity, to pressure on the trachea or esophagus,—depending upon their location. If the thyroid enlargement takes place forward, between the sternomastoid muscles, pressure signs are often absent. If, however, a relatively small tumor grows behind the insertion of the sternomastoid muscle, pressure symptoms are apt to arise as the muscle holds back the tumor from any outward growth. With these fetal adenomata there occur varying degrees of toxic symptoms on the part of the heart, nervous system, etc., which are rarely, however, accompanied by exophthalmos.

Goetsch believes that these adenomata have the power of secreting an excess of thyroid juice, which explains the marked relief of general toxic symptoms which almost always follow their removal. Operation, though at times difficult, is most satisfactory, and consists either of enucleation of the nodules from the thyroid tissue, or occasionally it is simpler to do a lobectomy, provided enough thyroid may be left behind in the other lobe to carry on the function of the gland.

Cysts are not uncommon, varying in size from a marble to enormous tumors containing a couple of quarts. Into them, now and then, occur sudden hemorrhages, which may cause even alarming pressure symptoms, but apart from this, their harmful effect is purely mechanical. If a cyst is suspected no harm will come from aspiration with a hypodermic needle, for diagnostic purposes, followed, if deemed advisable, by the injection of carbolic acid, corrosive sublimate, or some irritant designed to prevent recurrence. It is important to make this diagnosis, for treatments by iodine, x-ray, thyroid extract, etc., are absolutely contraindicated and useless in cyst formation. If cysts are increasing in size, or causing obstruction, they should be removed with the technic which will be described in thyroid operations.

5. Colloid is the most common form of thyroid enlargement and varies in all degrees. As a rule, operation is desired for cosmetic purposes, or owing to the formation of large bilateral tumors in the neck, with a varying amount of pressure symptoms. It is surprising to see to what a huge size some of these tumors may develop without causing any symptoms whatever. In other cases thyroid enlargements take place posteriorly, encircling the trachea, or trachea and esophagus, and bring about severe obstructive symptoms. Iodine and thyroid extract, with or without x-ray, sometimes cause diminution of these tumors, but in general their effect is slight, and surgery fulfills here one of its safest indications. In such thyroid enlargements, occurring before puberty, operation

should be delayed as long as possible, lest too much of the more or less active gland be removed and interfere with the proper development of the individual.

In regard to the technic of operations for benign tumors of the thyroid, the first question for consideration is the choice of the anesthetic. As my experience increases, I am more and more in favor of local anesthesia, where the mental attitude of the patient is satisfactory. While a change from local to general anesthesia is always possible, it is time-consuming, increases danger of infection if the patient struggles; and much judgment should be used in endeavoring to select those patients who will satisfactorily put up with the idea of being conscious while their neck is operated upon, or occasionally bear a little pain or sense of dragging. I give sulphonal—grains 20 to 30—the afternoon previous to operation, and one or two doses of morphia, commencing an hour and a half before the appointed time. With the second dose, 1/120 of a grain of scopolamine, which may be repeated just before operation, if the patient is not sufficiently drowsy. This combination of sulphonal, morphia and scopolamine is most satisfactory when it works well, but occasionally there is excitement instead of quiet, a condition like coma vigil,—the patient sleeping until the surgeon starts to do something, then waking up and resisting. If a general anesthetic is to be administered in such instances, it must be given with great care, as the patient is often overdressed for a satisfactory ether operation. A pillow should be placed between the shoulders, so that the neck may be hyperextended, the table in moderate Fowler's position, facing a good light. No pains should be spared for a proper posing of the patient before operation, as great difficulty will be found in carrying out a proper technic if the neck slumps backward. There is no doubt that the collar incision of Koehler is the best for these operations. This may be placed across the bottom of the neck, where a necklace will later conceal the scar, or it may be made by a low incision over the sternum, when no scar will be visible unless a low-neck is worn. I use a 1 or 2% novocaine solution with 1-40,000 adrenalin chloride. It is best to mark out the line of incision by an intradermal injection of the solution, which should bring out a white wheal on the skin. The novocaine acts thus quite quickly from tension, more slowly from its anesthetic action. If you will recall your anatomy you will remember that all the nerves supplying the front and side of the lower neck emerge from the posterior border of the sternomastoid muscle, from its mid point downwards for an inch and a half; the superficial cervical branch, the inner, middle and outer branches of the supraclavicular nerves. While we are waiting for the novocaine in our line of incision to act, these nerves at this point should be anesthetized by deep massive infiltra-



tion. The skin and platysma muscle should next be incised, usually from external jugular to external jugular, the posterior incision extending somewhat upward, rather than transversely, in the lines of cleavage of the skin. The upper flap should be dissected to the level of the bottom of the thyroid cartilage, the lower down to the sternum. The enlarged anterior jugular veins next come into view, and must be carefully clamped and tied between ligatures. The sternomastoid muscles are then to be dissected free and retracted. If the tumor is a large one, there is no objection to dividing these muscles a half to two-thirds through; mattress sutures will ensure no deformity. The surgeon has next to consider the advisability of separation of the sterno-hyoid and thyroid muscles in the median line, with lateral retraction, or a transverse division of them at a higher level than the skin incision. There is little doubt that separation is preferable to division on account of less post-operative pain in swallowing, and freer movements when the wound is healed. Large or vascular tumors require free exposure for neat and bloodless work, and the muscles must then be divided. No time will be lost, and convenience assured, by immediate ligation of all skin vessels. Fine plain catgut should be used rather than silk, as in many instances chronic gut or silk ligatures are discharged from just under the skin some time after the wound has apparently healed. The intrinsic capsule of the thyroid varies much in thickness and in adherence to the gland. Any previous infection or treatment with boiling water, or x-ray, makes its removal more difficult. Anteriorly the capsule is of no importance, but if we are to operate upon both sides of the gland, it marks behind the curtain beyond which lie the recurrent nerves and the parathyroid bodies. When the muscles have been well retracted, careful inspection of both lobes is necessary to determine what operation shall be done,—enucleation of a cyst or an adenoma, removal of the anterior two-thirds or three-fourths of both lobes, or hemithyroidectomy on one side, and upper partial lobectomy on the other.

Lobectomy is comparatively simple and bloodless. The gland is grasped with gauze or a double hook, pulled toward the median line, and the upper and lower vessels clamped between forceps and divided. In spite of care there is often some troublesome bleeding near the middle of the gland, where the inferior thyroid breaks up into a number of branches. An injury to the nerve usually occurs from hurried grasping of a bleeding vessel through the capsule. Local anesthesia has the great advantage that it forces the surgeon to work gently and slowly, and any change of voice can be immediately noted. As a rule, these manipulations are painless, but occasionally the patient complains when a ligature is tied, or the tumor is dragged upon. Several times I have enucleated a cyst or tumor from

behind the sternum, and have been surprised at the freedom from pain. If supplementary injections of novocaine are necessary, it must be remembered that several minutes are required for complete anesthesia. The common error made is to begin without this delay. In large, irregular tumors, Balfour's suggestion is valuable, *i.e.*, the division of the isthmus, and separation from the trachea of the two halves of the glands from within outward. After the amount to be removed has been determined, every effort should be made to control the blood supply by deep mattress sutures or pressure by the finger on the vessels at the base of the lobe. When all bleeding has been stopped, the remains of the lobe are then sutured, leaving behind the lower rather than the upper poles. In all cases of tracheal obstruction, local anesthesia is invaluable. When once the trachea has been bared and is clearly visible to the eye, a general anesthetic may be safely administered, if necessary. In spite of all precautions, hemorrhage (sometimes serious) takes place in a definite proportion of cases. Most frequently a vein is torn in delivering the gland,—a danger much increased when patients are cyanotic from obstruction or vomiting under ether. In general, drainage can be omitted. If used, a small stab wound through the lower flap is preferable to its insertion through the line of incision. Whenever there is mild infection of a drain through the incision, there is apt to occur a dimple adherent to the deeper tissues, which causes an unsightly deformity, and dragging on deglutition. The platysma must always be sutured with care; the skin incision closed either by a sub-cuticular catgut suture, or interrupted fine silk or horsehair stitch loosely tied and removed within three days. With this technique the scar of the collar incision is practically invisible. A moist dressing for twenty-four hours allows oozing from the drain or between the stitches. At the end of two days the drain should be removed, and in the mean time great care must be taken to prevent infection from looseness of the dressings. I use a single large gauze sponge snugly held to the skin by adhesive plaster at the top. This is raised like a lid, and the dressing applied, which is held in place by a row of pins behind the neck, crossed and pinned to the front. For severe cases, the dressing is made of painful, and patients are often annoyed by means and methods which are not necessary. Drainage is seldom necessary, and if used, there is usually no need of a drain tube, the serum which collects being removed by frequent aspiration. For the scar of the collar incision, it is better to be prepared with a small piece of fine mesh silk, which is sutured to the ends of the incision, and the ends of the platysma are sutured to the ends of the incision, and the tumor is dragged upon. Several times I have enucleated a cyst or tumor from



ondary hemorrhage. Three times a recurrent laryngeal nerve has been injured, either in the dissection, or carelessly grasped in the attempt rapidly to control bleeding. Though some of the tumors and cysts have been very large—one filling up a third of the superior mediastinum, and another adherent to the sternum beyond its middle—I have had no death in more than 100 cases until last month, when an old lady of 65, who for 40 years had had a very large cystic tumor, died from hemorrhagic nephritis and bronchopneumonia.

There have been a few instances of continued growth of the tumor or formation of a new cyst, making necessary a second, and twice a third operation. The surgery of non-toxic goitre, then, though often difficult, is extremely satisfactory—the cosmetic results good. The exact opposite is true of malignant disease. In the last fifteen years there have been twenty operations at the Massachusetts General Hospital. Of these, 17 were cancer and 3 sarcoma. One case was 25 years old, one 29, one 32, one 33 all the others over 40. The oldest patient (63 years of age) had had an enlarged thyroid for twenty years, with rapid growth in the last two. There were five cases of very long duration of a goitre subsequently undergoing malignant degeneration,—one 35, one 25, one 20, one 12, one 7, another 4 years after onset. This shows quite clearly what my experience confirms,—that the development of an enlarged thyroid after fifty, or rapid increase in a long-standing goitre, is an indication for immediate operation. When once the diagnosis of cancer is clear, from the stony hardness of the tumor, paralysis of the recurrent laryngeal nerve, and enlargement of the adjacent lymphatics, a radical operation is practically hopeless. The only chance of cure rests in a thorough operation before the carcinoma has spread beyond the capsule of the gland. In one private case such an operation was done, with the removal of a portion of the esophagus. For a year there was complete comfort, but recurrence then took place. In two other patients over sixty, with rapid growth in a few months, recurrence followed operation too soon to make it worth while. Where obstruction to respiration makes tracheotomy necessary, local anesthesia is clearly indicated. This will be found to be a most bloody and trying operation, not rarely followed by secondary hemorrhages; pneumonia and bleeding commonly end the life of these wretched patients.

We have next to consider the toxic cases—so-called hyperthyroidism. As my paper deals only with the surgical aspects of Graves' disease, I shall not enter into the various theories as to its causation and complex relations or interrelations with the other glands. One thing remains clear—the etiology is not yet thoroughly understood. It is also, I think, impracticable to divide the toxic cases too minutely into groups. Broadly speaking, however, there are two

types: one, where the patient for months or years has had an enlarged thyroid, and subsequently developed the toxic symptoms; another group where, preceding any manifest thyroid enlargement, there is nervousness, tachycardia, palpitation, etc., or the general symptoms develop with an increasing enlargement of the gland. If any rough distinction can be made, the first class may be called tumors with hyperthyroidism; the second, true cases of exophthalmic goitre. It is in this latter class (2)—though, of course, there are exceptions—that we find the most severe toxemia, exophthalmos, and the greatest loss of weight. What, at present, are the indications for surgery in these two types of cases? What are the dangers of operation, and what has surgery to offer better than medical treatment? Quite recently the x-ray, being safe and favorably regarded, is being used more and more. The invention of the Coolidge tube, which allows measured, massive dosage, may prove a valuable aid in this disease. Personally, I have been in the habit of having one or two thorough treatments previous to operation. I have had little experience with long-continued treatment. While, undoubtedly, marked improvement has occurred, particularly in the milder cases, I have not been impressed with the results, and in one case in particular, I can see very little improvement after a year of treatment. Dr. Seymour, who has recently been following a series of cases, will later give us his impressions. It has one great advantage,—if not persisted in too long,—the element of safety and the absence of scar. There are some surgeons, notably Kocher of Berne, who think that surgery is the ideal treatment for thyrotoxicosis. He operates as early as possible after a very brief period of rest, and refuses operation on all advanced cases. His mortality is small (about 4%), because, in fact, he operates upon a selected group of cases. The general feeling at present is, I think, that all cases of Graves' disease should first be treated by rest and medical treatment. If satisfactory improvement occurs, this may be continued, but is not applicable to wage-earners and those who cannot give up the time. While under neutral bromide of quinine and other drugs, almost miraculous improvement takes place now and then, it is my experience that such cases are apt to recur, and that if lobectomy, single or double partial, has been performed, cures occur more rapidly and are more permanent. I would advise operation of some sort, then, in cases where improvement is unsatisfactory under medical means; in cases which have already lasted more than a year, with commencing myocardial weakness, exophthalmos, etc., or where it is unlikely that medical treatment will act sufficiently quickly to bring about a satisfactory result. Plummer of Rochester believes that after a year, operation is less hazardous than in the early stages. My experience has shown that



Graves' disease in girls from 18-20, particularly if the mental attitude is excitable, has seemed to carry a grave operative prognosis. Another type in which the risk is poor are women between 40 and 50, who are apparently passing through the menopause. The Hebrew race, owing to their neurotic constitution and lack of control, make a calm preparation for operation difficult, and I have had, among them, a comparatively large mortality. There is another group of rather chronic cases of years' duration, with ups and downs,—exophthalmos, rather firm vascular glands, tachycardia, often irregularity of the heart,—in which there is doubt as to whether the patient is actually suffering from Graves' disease or the aftermath of a passed toxemia. It is in this type that the various newer tests are of very great value. I mean estimation of the carbohydrate tolerance, basal metabolism, differential blood counts, injections of adrenalin, etc., in order that we may determine, if possible, whether the symptoms are due to an overactive gland. In these cases it is probable that other glands, the sympathetic system, and the myocardium have been affected; and it is often a nice question of judgment to decide for or against operation.

Before considering operation, there is one thing I wish to emphasize, and that is an increasing conviction that the psychic influences before operation are of extreme importance—in fact, I believe make for recovery or death in certain instances. The surgeon should have absolute control of the situation, and the complete confidence of the patient who, if possible, should look forward to the day of operation, unless we follow Crile in all detail in his "theft of the thyroid." In no other surgical disease do the surroundings, methodical nursing, cheerful mental attitude, etc., count so much; to no other patients do the occasional worries and effects of a large clinic work so great a detriment. If, as I believe, the mental attitude of the patient is so important, it is queer that surgeons have not come to more unanimity upon the choice of an anesthetic. Kocher has always insisted upon local anesthesia, and I have seen him adhere to this rule to, if not beyond, the limit. The Mayos, whose mortality is equally small, have the patient brought to the amphitheater and quietly etherized by the drop method. Crile, as we know, endeavors to carry out his anesthetic conception, planning to keep the actual date of the operation from the patient, and gives gas and oxygen in the patient's bed. As my experience increases, I am more and more in favor of the morphia-scopolamine sequence with local anesthesia, when the patient's mental attitude is favorable and the drugs act well. In a few operations I have had to abandon local anesthesia, owing to the complete lack of control of the patient, and have felt that this abortive attempt was much worse than if I had started with a general anesthetic. Indeed, I will go far

and say that in bad cases of Graves' disease, if anything goes wrong with the preparation for operation, and a patient arrives in a highly excited condition, it is always best to delay for a more favorable opportunity.

From the 185 cases in hospital and private practice which I have had, I have selected the 85 which, at time of operation, showed definite Graves' disease or hyperthyroidism present, or very definite in the immediate past. I have excluded the milder cases of transient hyperthyroidism, and considered them in the previous part of this paper. In these 85 cases I have performed 31 ligations, 19 hemithyroidectomies; in 17 the right lobe was removed with ligation of the vessels on the left; in 18 the major portions of both lobes, leaving a bit of the upper or lower poles, and a posterior strip of the gland. Double partial lobectomy is, in my opinion, a more severe and bloody operation than hemithyroidectomy; but as I look over my cases I feel that more immediate improvement takes place, and the danger of recurrence of symptoms is less. The most difficult question to determine when once operation has been decided upon, is between preliminary ligation of vessels, or removal of portions of the gland. Upon this question different surgeons are not in agreement. A majority, I believe, feel that in the severer cases a preliminary operation of ligation, usually under local anesthesia, makes a subsequent thyroidectomy less dangerous. Whoever has done a secondary operation on these cases is convinced of two things,—that ligation makes the operation somewhat harder, owing to adhesions, and secondly that the ligation of the superior vessels has not much diminished the vascularity of the gland. I think the benefit which frequently follows is due to division of the sympathetic nerves accompanying the vessels. In two cases only has ligation of the superior vessels been sufficient to bring about a cure; after it there has usually been either no perceptible improvement or a period of improvement followed by recurrence. It should be remembered, strictly as a preliminary operation and second, at varying periods, be followed by further operation. In a number of my cases, before the patients would consent, intervals of six months to three years have elapsed, at which time the element of safety after ligation was not established. In such cases, therefore, I consider, if they are severe, that the vessels should be ligated before the thyroidectomy is attempted. For the future of the operation, I have decided to be according to the following plan: In the severe cases, the vessels should be ligated first, or the vessels and a portion of the gland removed. In the moderate cases, the vessels should be ligated first, and the gland removed at a later date. In the mild cases, the gland should be removed at once.

After a preliminary operation of ligation, the patient should be kept in bed for a few days, and the wound should be dressed with a sterile dressing. The patient should be kept in bed for a few days, and the wound should be dressed with a sterile dressing. The patient should be kept in bed for a few days, and the wound should be dressed with a sterile dressing.



tophobia and confinement in a dark room for three months. Ligation was simple, but in spite of all treatment, death with all the characteristic symptoms, occurred at the end of three days. This was a desperate risk taken deliberately. Of the four other cases the operation was a primary lobectomy; two were in young girls eighteen and twenty-five years; two middle-aged women undergoing the menopause.

The one aged eighteen deceived me in her degree of toxicity. Right hemithyroidectomy with ligation of the left vessels was performed under ether, in 1910, and was followed by a typical toxic death in three days. The one aged twenty-five was a very toxic case; had been sick for eight years, and did not improve under three weeks in bed with rest treatment; in fact, on the whole, seemed worse. Right hemithyroidectomy, under gas and oxygen with ligation of the vessels on the left was performed; operation comparatively easy; died on the third day of typical toxemia.

A girl of thirty had extreme symptoms for two years; was unable to work for a year; fell exhausted on the street several times; treated in medical ward without improvement; heart irregular; marked systolic murmur with some enlargement. Right hemithyroidectomy under gas and oxygen, and partial left thyroidectomy were performed with extreme reaction, which persisted unusually long, leaving marked condition of prostration; patient died nine days after operation. All of these three were early cases, and at present I believe that a preliminary ligation should have been done, or the patients should have had x-ray treatment previous to operation.

A Jewish woman of forty, undergoing the menopause, suicidal for a year, refused operation four successive mornings. Finally she consented to it if I would perform it in the afternoon. Rather against my judgment, at the earnest solicitation of her husband, I agreed to do it, under gas and oxygen, removing the right lobe and half of the left. There was considerable bleeding, and with excessively rapid pulse the patient died in three hours. This was in 1909, and did much to influence me against operation. I have broken this rule since then once or twice, always to my regret, and with a severe operative, though not fatal, toxemia; until in March of this year I had another death, the first since 1912. A Jewess of 47 had been ill for five years with nervousness, headache, irregular menstruation, edema and dyspnea, pain in the upper abdomen, rapid pulse, with some enlargement of the heart, some glycosuria, unable to work. Under careful medical treatment for two and a half weeks, she lost seven pounds, and tachycardia and nervousness persisted. I advised ligation under local anesthesia as a preliminary. She had her morphia in two doses and was apparently drowsy, but before operation could be begun she jumped up from the table and insisted upon going home. Three days

later she consented, provided her daughter was present, to have operation under gas and oxygen. I performed a double partial lobectomy without difficulty, but from the time of her recovery from the anesthesia, extremely rapid pulse with excessive nervousness began, and increased until death, at the end of forty-eight hours. This illustrates strikingly, I think, a bad risk in a woman who was steadily running downhill. Operation undertaken was the only hope, and owing to lack of control, toxemia started before operation, and was only increased by it—I think it an error of judgment in attempting to benefit a patient unwilling to accept one's best advice. In four cases severe bronchitis, pneumonia or bronchopneumonia, for reasons which I cannot explain, ended fatally in from a week to a month. In the latter long case the ultimate cause of death was heat prostration in the severe July of 1911. A fifth case died, so far as could be made out, from a terminal pneumonia, aided probably by unsuspected morphinism. Why pulmonary complications should have occurred in these cases and been absent in the non-toxic goitres, it is impossible for me to explain. Another death, similar to a case of Dr. Judd's in Rochester, I cannot understand. Autopsy showed purulent pericarditis, enlarged thymus and adrenals, as a cause of death thirty-six hours after a simple ligation with a clean wound. In another, a large infarct of the right lung, after a very satisfactory gas and oxygen thyroidectomy, caused death on the third day. In this series of 185 cases, there was one instance of tetany—the first post-operative case at the Massachusetts General Hospital. A young girl of eighteen, with severe Graves' disease, had double ligation under ether in 1911, followed by marked improvement which lasted for almost two years—then recurrence of symptoms. Under gas and oxygen in October, 1914, right hemithyroidectomy and partial left lobectomy were performed. The operation was apparently intra capsular. On the fourth day characteristic tetany developed, which was controlled with calcium lactate. In spite of parathyroid tablets and continued calcium lactate, severe convulsions occurred, followed in January, 1915, by acute mania and death. It seems to me necessary to believe that in this instance the blood supply of the upper parathyroids was cut off by the ligation, or the unfortunate patient had an abnormally small number, for the operation was performed in such a manner that some of the parathyroids under normal circumstances must have been conserved. Thus this analysis seems to show that the danger of toxemia is diminished by preliminary ligation a short time previous to thyroidectomy; that perfect control of these patients is necessary, lacking which operation should not be performed. There has been no death from pulmonary complications following local anesthesia. The ease of pul-



monary infarct and purulent pericarditis seems to me to be impossible to avoid.

In endeavoring to analyze the good results of operation, it is most difficult to make satisfactory statistics. Those who have seen the very marked relief within a few days which follows lobectomy, are absolutely convinced that the thyroid *has to do* with Graves' disease. On the other hand, there are occasional cases which, in spite of ligature and lobectomy, disappoint us with their lack of improvement. Some surgeons believe that the thymus gland is in part responsible for the symptoms, and state that improvement has finally taken place after thymectomy. With this operation I have had no personal experience. I am inclined to believe, however, that the failure distinctly to improve or cure a majority of these cases is due to delay in operating until permanent degenerations have taken place, or some not understood action of the sympathetic nerves or other glands in the body.

I have operated upon some quite desperate cases with marked improvement. One, a young girl, with congenital heart murmurs who, it was decided, could not survive the cardiac lesion plus the toxemia of Graves' disease, has been practically cured, as far as any toxemia is concerned, by preliminary ligation, followed later by thyroidectomy. Another woman who was bedridden with coincident mitral insufficiency and severe Graves' disease, is now entirely cured of all her Graves' symptoms, except slight exophthalmos. Another middle-aged woman, bedridden, with marked edema and rapid, irregular pulse, has, after operation, improved so that she can do her work, though some tachycardia and irregularity of the heart persist. Another woman of fifty-five, confined in an asylum, much to my surprise became almost normal after operation; was able to look after herself and go to the theatre alone; dying suddenly of pneumonia a year afterwards. In my experience, the cases which have had exophthalmos for any length of time never again have normal eyes, and not a few of the cases apparently cured under normal circumstances show, under excessive fatigue or worry, slight tachycardia and tremor. Of the 85 cases, 20 are absolutely cured, 18 much improved, 13 improved, 1 not improved and require further operation; 16 have not reported, or done so in too general terms to be valuable for statistics. If then, after a patient has had a reasonable course of rest, medical treatment and x-ray treatment (if it proves to be really and permanently satisfactory), the symptoms persist, operation should be advised. Among wage-earners, who cannot give up the time, and in the chronic cases, in which the disease has advanced too far to allow of delay, after preliminary rest, operation should be performed. Whether this be a preliminary ligation, or lobectomy under local or general anesthesia, must be determined in each

case. Finally, in chronic cases in which there is doubt as to whether the patient is suffering from existing toxemia or has been poisoned irreparably by the disease, modern tests, of which basal metabolism is probably the most important, will aid the surgeon much in deciding for or against operation.

## II.

### RECENT ADVANCES IN OUR KNOWLEDGE OF THE ACTIVE CONSTITUENT IN THE THYROID, ITS CHEMICAL NATURE AND FUNCTION.

By EDWARD C. KENDALL, Ph.D.

*The Mayo Foundation, Rochester, Minn.*

ABOUT eighteen months ago I reported the isolation from the thyroid of a crystalline compound containing 60% of iodine. Since that time I have perfected the method for its isolation, and to some extent have studied its chemical properties and functions. The work may be briefly summarized as follows:

The compound was first isolated in crystalline form in 1914. The work just prior to the isolation had been accomplished with such smoothness and success that no difficulty was anticipated in repeating it, but despite most persistent efforts, no more crystals were isolated until August, 1915. Again it seemed that the isolation had been perfected, but try as we would, no more crystals were seen until February, 1916. This failure occurred in spite of the fact that







FIG. 2.—Appearance of patient upon entering clinic.



FIG. 3.—After six months' treatment with the alpha radium compound. Patient had grown  $2\frac{1}{2}$  inches.



FIG. 4.—Appearance of patient upon entering clinic.



FIG. 5.—After six months' treatment with the alpha radium compound. Patient had grown  $2\frac{1}{2}$  inches.





FIG. 6.—APPROXIMATE LINE OF SCAR.



FIG. 7.—APPROXIMATE LINE OF SCAR.







FIG. 10.—Appearance of patient upon entering clinic.



FIG. 11.—After 24 days' treatment, during which time the patient received the alpha iodine compound.



FIG. 12.—Appearance of patient upon entering clinic.



FIG. 13.—After 24 days' treatment, during which time the patient received the alpha iodine compound.





FIG. 14.—Normal monkey before injection. Weight 13½ pounds.



FIG. 15.—Same monkey 72 hours after injection of alpha iodine compound. Weight 6½ pounds.

the work was vigorously carried on, more than a ton of thyroid being used. It was found by accident that carbon dioxide plays a most important rôle. When I first obtained the substance I was working in a room next to a freezing microtome, and the necessary carbon dioxide was supplied from this source. Later the work was carried on in a room free from excessive carbon dioxide, and crystals were not obtained until it was accidentally discovered that carbon dioxide is necessary.

The reason for the delay and difficulties in this problem lies in the fact that the substance does not exist in a free form in the thyroid secretion, but is firmly locked into the protein molecule. This bond is so secure that it will withstand very vigorous chemical treatment. It is very resistant and the compound is not easily destroyed, but under other conditions simply dissolving will result in the destruction of the compound. The explanation of this behavior lies in the fact that carbon dioxide exerts a peculiar and unique action on the bond that ties the iodine compound within the protein molecule. In short, this bond, which will resist heating with

50% sodium hydroxide, is broken by carbon dioxide and the iodine compound is set free. Having once been liberated from the rest of the protein constituents, its chemical properties permit of very easy separation.

Having separated the crystalline compound containing 60% of iodine from the thyroid, several questions arise as to the relation of this compound and thyroid activity. Thyroid activity can be followed experimentally and clinically, in five broad aspects, namely, the effect on growth, on the mentality, the skin, the hemoglobin, and, greatest of all, the effect on metabolism, and, incident to this, the effect on the heart. It seems indisputable that all of the effects produced by the thyroid are through its effect on metabolism. The combustion of proteins, fats and carbohydrates is increased by the administration of thyroid substance, and it is probable that the various clinical effects produced are due to increase in metabolism through the entire body. The heart rate is increased because of the increased metabolism, and the increased action of the heart is due to

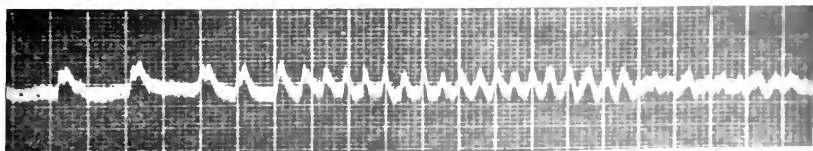


FIG. 16.—Ventricular fibrillation before 100%  $\text{CO}_2$ .



brain cells; the condition of the skin is improved because metabolism within the skin cells is increased; and so it is through the entire body. We have experimented with this substance on animals and have obtained a large number of results from clinical observations. It appears that the entire activity of the gland is manifested by the administration of this crystalline compound alone. There appears to be no other substance in the thyroid secretion which acts directly. This substance, given even in very small amounts, will supplant thyroid activity, relieving the conditions of myxedema and cretinism, and in excess will produce symptoms simulating exophthalmic goitre. It appears to have no direct action on the pulse rate. The extent to which the rate is affected depends not upon the administration of the thyroid, but upon the simultaneous ingestion of food, and in particular of amino acids. This effect may be outlined as follows:

After the administration of the compound, there is no apparent effect for many hours. There is no increased pulse rate, nor drop in blood pressure. However, if the thyroid hormone and amino acids are injected simultaneously, the pulse rate is enormously affected, and even death may result, due to the apparently great increase in metabolism going on in the animal. It appears very probable that the thyroid hormone manifests its activity by reacting in some way with amino acids. The accompanying are typical pictures, which illustrate the effect on myxedema and cretinism, on the mentality, on the skin, and the great emaciation with a toxic effect on the heart after long-continued injection.

### III.

#### CONDITIONS AFFECTING SECRETION OF THE THYROID GLAND.

By W. B. CANNON, M.D., BOSTON.

[From the Laboratory of Physiology, Harvard University.]

A STUDY of the conditions of activity in the ductless glands, which pass their secretions into the blood stream, is difficult because recognition of the secretion in the blood is uncertain or impossible. It has long been known that physiological activity is accompanied by the development of an electrical difference, which may be manifested by connecting an active part with an inactive part through a delicate galvanometer. It seemed possible that by the application of this method important information might be obtained as to the conditions of activity of the ductless glands. This work has been carried on through the coöperation of Mr. McKeen Cattell.

The method was first justified by applying it to the submaxillary gland, which has an external secretion. Because an electrical change ac-

companies the secretion of saliva, even though the blood supply is shut off from the gland or the flow through the duct is stopped; and because the change is absent when secretion is absent, although each of the conditions attendant on secretion—such as contraction of blood vessels, relaxation of blood vessels, faster flow of blood, slower flow of blood—may severally be induced, the conclusion is drawn that the electrical change is a manifestation solely of the process of secretion.

The method thus justified on the submaxillary gland has been applied to the thyroid. Histologists have described nerve fibres leading to the cells of this gland, and anatomists have reported that the fibres going to the thyroid gland arise in the cervical sympathetic ganglia. Previous investigators have shown that severance of its cervical sympathetic nerves causes atrophy of the thyroid, and stimulation of these nerves causes a diminished iodine content of the gland. Severance of the vagus nerve supply has no effect.

If the thyroid gland and neighboring indifferent tissues are connected through a galvanometer, stimulation of the sympathetic strand high in the thorax evokes an action current after a latent period, varying usually between 5 and 7 seconds. This effect persists after the superior and the recurrent laryngeal nerves are severed. Experiments have shown that the nerve impulses pass out through both the superior and inferior cervical ganglia.

Stimulation of the main trunk of the vagus nerve in a curarized animal, or injection of pilocarpine (which excites vagus endings), has no effect in producing an action current in the thyroid gland.

The influence of sympathetic impulses is not indirect, through local anemia of the gland, for when the blood supply is wholly stopped by clamping the blood vessels for a period equal to that of sympathetic stimulation, no noteworthy electrical change is produced.

The conclusion is drawn, therefore, that the nerves distributed to the thyroid cells belong to the sympathetic and not to the vagus supply, and that their effects are not indirect through alterations of blood flow; indeed, that they are true secretory nerves.

It is known that the internal secretion of the adrenal gland, or adrenin, will have the same effect in the body as sympathetic nerve impulses. Injection of a small dose of adrenin, 0.1 to 0.2 cc. (1:100,000), evokes a marked action current in the thyroid gland. Also, stimulation of the nerves to the adrenal glands, so as to cause their secretion to be poured into the blood stream, will evoke a characteristic electrical change in the thyroid. This electrical change does not occur if the return of blood from the abdomen is prevented, but takes place promptly when the pent blood is released. Furthermore, it fails to appear after stimulating these nerves, if the adrenal glands have been previously re-



moved. There is thus definitely established an influence of adrenal secretion on thyroid activity.

This conclusion has been confirmed by the observations of Dr. Robert L. Levy, working in the Harvard Laboratory. He has found that both stimulation of the cervical sympathetic trunk and injection of stimulating doses of adrenin greatly augment the effects of small doses of adrenin in raising blood pressure. This increase of efficacy of adrenin is not produced if the thyroid glands have previously been removed.

Studies on conditions of activity of the adrenal glands have shown that during emotional excitement they secrete into the blood a substance which affects the bodily organs in a manner stimulating the nervous influences of strong emotions. These glands have a routine function, without which certain bodily processes are not normal. They may also be reasonably regarded as having a normal *emergency* function, which is exercised in times of emotional stress, and is important under such circumstances for the needs of the organism, for example, in struggle. This conception of an emergency function gives meaning to the liberation of sugar in the blood, abolition of muscular fatigue, dilatation of bronchioles, inhibition of digestion, redistribution of blood in the body, and rapid coagulation—all changes attending great excitement.

If we conceive the organs disturbed in emotional stress as being protected from such disturbance by a high neurone threshold, requiring great excitation in the central nervous system before the threshold may be crossed, we can account for persistent disturbance of these organs in pathological cases on the basis of a wearing down of the threshold through great or repeated emotional disturbances. Thus there might be gaps here and there in the wall that protects the organs from being over-excited. Under such circumstances, even slight central disturbances might result in persistent stimulation of organs normally brought into action only when such action would be useful, *i.e.*, in times of emotional excitement, when struggle might be essential. If a certain region, *e.g.*, the cervical sympathetic, is thus persistently stimulated by experimental means, most of the phenomena of exophthalmic goitre may be produced. This concept offers an explanation for emotional tachycardia, emotional dyspepsia and perhaps other conditions which present a history of previous great worry or emotional stress.

To test the effect of over-stimulation in a particular region of the sympathetic system, Dr. C. A. L. Binger and I, about two years ago, fused in the cat the anterior root of the right phrenic nerve with the right cervical sympathetic strand. Thus, after regeneration had occurred, there was delivered to the neurones in the superior cervical ganglion a volley of im-

pulses every time the animal breathed. The operations were performed early in May. In October, 4 of the 6 animals were still alive. All had peculiar symptoms. There was marked tachycardia,—the average heart rate in normal cats is about 150 per minute, in 30 observations on these animals it was 222. Though fed like normal animals, they had loose movements of the bowels. They were unusually excitable, as indicated by rushing away when taken in hand or petted. The basal metabolism, as determined by Dr. Reginald Fitz, working in the Carnegie Nutrition Laboratory, was found in normal cats to be approximately 31 calories per square meter of body surface per hour. In 3 of the 4 animals in which the operation had been performed, the metabolism was much elevated. In one of them (in all ways the most profoundly altered animal) it rose to an average of 72 calories per square meter per hour,—an increase over 130% above the normal average. In others the rise was approximately 100%. In two animals that died of the disease, the adrenal glands were found much increased in weight. In one of them the glands were three times the average weight, the increase being chiefly in cortical substance. One of the animals had definite exophthalmos and respiratory oscillations of the pupil on the operated side. These symptoms are, in the main, characteristic of exophthalmic goitre as seen in man.

Since these first observations, the disease has been produced in another animal, and it has been proved that the symptoms, rapid heart, increased excitability, steadily mounting metabolism, with loss of weight—all disappear on the removal of the thyroid gland on the operated side. The metabolism, which had increased approximately 100%, dropped down to within normal limits. Whereas the other animal living the induced disease had died within three months of the first appearance of the symptoms, this animal lived normally for six months after the operation and then died of pneumonia, killed.

The thyroid gland of the animal that lived six months after the operation was found to be of the average size and weight of the normal gland. It was found to be normal in all respects, and the animal lived normally for six months after the operation and then died of pneumonia, killed.



## IV.

## THE CLINICAL VALUE OF METABOLIC STUDIES OF THYROID CASES.

BY WALTER M. BOOTHBY, M.D., BOSTON.

[From the Surgical Service and Respiration Laboratory of the Peter Bent Brigham Hospital, Boston.]

THE brilliant researches of Lavoisier on the nature of oxygen, carbon dioxide, and heat led him to propound the fundamental proposition that the life processes were those of oxidation with the production of heat,—and thus to found the science of metabolism.

Since then it has been demonstrated that the complete combustion of substances in the body is not only qualitatively, but quantitatively, identical with the burning of those substances outside the body. Consequently it is now possible to calculate the amount of heat produced by the metabolic processes from a knowledge of the oxygen consumed and the carbon dioxide eliminated in a given time.

For clinical purposes these factors for calculating the heat-production can be determined with a high degree of accuracy by collecting, measuring, and analyzing the expired air.

In order to compare the heat production of one patient with that of another, it is necessary to eliminate such disturbing factors as muscular activity and the stimulating action of food. Hence absolute rest and abstinence from any nourishment for at least twelve hours before the determination are essential. The heat-production obtained under these conditions is known as *basal metabolism*.

The general application in the clinic of metabolic data has not, until very recently, been of much practical value, because the comparative standards used showed wide variations in the basal metabolism of normal people. This problem is not even now completely solved, but DuBois<sup>1</sup> has shown that, when compared by surface area determined by a height-weight curve proposed by him, the basal metabolism of normal people rarely varies more than ten per cent. from an average figure, the latter depending on age and sex.

Some six hundred determinations of the basal metabolism have been made on one hundred and forty patients during the past year in the Respiration Laboratory of the Peter Bent Brigham Hospital. The cases studied have been those in which chronic metabolic disorders were a possible factor in the production of the symptom-complex, as well as a considerable proportion of traumatic and miscellaneous cases for comparison.

We have found that convalescent, post-operative cases of acute appendicitis, hernia, varicose veins, alveolar abscess, and similar conditions, with normal temperature, after varying periods of recumbency, have shown, with one exception, a basal metabolism which does not vary more than ten per cent. from Du Bois' normal, and in

the majority of cases the metabolism is within five per cent. of his normal figure.

The patients in whom we have found an abnormal variation in the basal metabolism are those in whom involvement of an endocrine organ could either be established or considered as a possibility.

The endocrine organs furnish a series of substances, designated by Schaefer<sup>2</sup> as autacoids, which enter into the blood stream and act on certain body cells, either exciting or depressing their functions. For normal metabolism, Paton<sup>3</sup> believes that a certain amount of each autacoid is essential and that some proportion between the amounts of each must be maintained.

Abnormal variations in the amount of some of these autacoids are known to speed up or to slow certain cell activities, producing definite pathological conditions with a corresponding alteration in the basal metabolism. It has been possible, therefore, to explain many metabolic diseases like myxedema, acromegaly, and exophthalmic goitre, by alterations in the quantity or character of the secretion produced by an endocrine organ.

No factors other than the autacoids have yet been discovered which are known to influence basal metabolism, with the possible exception of the toxins in fevers. Therefore it seems logical to reverse the accepted theory and, except in the case of infections, to suggest the tentative hypothesis that a variation of the basal metabolism beyond normal limits is due to an abnormality in the secretion of one or more of the endocrine organs. The particular autacoid must then be sought for by characteristic localizing symptoms and by the elimination of those autacoids, variations of which produce well-known signs and symptoms.

This hypothesis allows a clear-cut division to be made between diseases in which the metabolism is increased, decreased, or remains normal, together with the probable cause of the disordered metabolism. Such a division is fundamental because it is made on an accurate knowledge of the rate at which the body cells are actually living. It will, therefore, serve as a foundation on which the subsidiary objective and subjective symptoms can be superadded, thus aiding in differentiating into distinct disease entities some of the present confused clinico-pathological groups, like the anemias and chronic nephritis. In both of these ill-defined groups we have found, as might be expected, marked divergence in the metabolic findings. Such variations are not to be looked upon as accidental or inconsequential—they must be considered as absolutely fundamental.

Important as is the diagnostic value of metabolic studies in endocrine disorders, of no less importance is their value in determining the proper method of treatment, since conditions of over- or under-activity require different therapeutic measures. The determination of the



basal metabolism before, during, and after treatment, will give in mathematical terms, easily understood, the value of that treatment. It will indicate whether the procedure has been beneficial or, on the other hand, harmful.

Diseases of the thyroid gland, with their extreme variations in the basal metabolism, afford a most striking example of the significance of metabolic studies. Furthermore, the connecting link between the etiological cause and the clinical picture is, in these diseases, most evident. In conditions of thyroid overactivity the metabolism may increase to one hundred per cent. above normal, and in conditions of underactivity it may be decreased to fifty per cent. below normal. Moreover, we have found that the patient's condition, judging from the sum total of the objective and subjective symptoms, corresponds very strikingly to the numerical expression of the basal metabolism.

The following case is illustrative.

C. W., aged 23, candy dipper, unmarried. Entered the hospital June, 1915, for chronic appendicitis. At that time the thyroid gland was described as somewhat enlarged but no constitutional symptoms were noted. In February, 1916, she re-entered complaining principally of swelling of the neck with very slight pressure symptoms. There had been progressive loss of weight from 125 to 105 pounds. Her skin was moist and red. She had slight psychic symptoms. The eye symptoms were practically negative, there being only a questionable exophthalmos. The slight tremor of fingers and tongue present increased under excitement. Her pulse was not particularly rapid, being seventy at rest, although it increased markedly on exertion. There was fullness of the neck and the thyroid lobes were palpable, but there were no thrills or bruit. The basal metabolism at this time was twenty-eight per cent. above normal. Partial thyroidectomy resulted in (Dr. Jacobson) improvement in the clinical symptoms. Patient was discharged eight days after operation. Her metabolism had then become normal. She returned to work and on re-examination six weeks later the metabolic findings were still normal.

In this case the diagnosis lay between a small colloid non-toxic goitre in a patient with slight nervous temperament from other causes and the early stages of a mild type of toxic non-exophthalmic goitre. The latter interpretation was definitely made by the metabolism studies, which showed an increase to twenty-eight per cent. above normal. Immediate operation was therefore advised; expectant treatment would have been permissible only if the metabolism had been normal. The operation was done consequently before the thyroid toxemia had produced any profound and long-lasting constitutional disturbances; hence recovery was correspondingly prompt and no long post-operative rest was necessary for recuperation.

No such rapid recovery occurs in patients in whom the thyroid intoxication has been of sufficiently long duration to produce profound secondary constitutional disturbances.

The following case illustrates a slow but complete recovery:

A. J., aged 33, housewife, entered hospital in September, 1915, presenting symptoms of moderately severe exophthalmic goitre of at least eleven months' duration. The basal metabolism was determined and found to be thirty-five per cent. above normal. Partial thyroidectomy (Dr. Homans) resulted in a general clinical improvement and fourteen days after operation the metabolism decreased from thirty-five to twenty per cent. above normal. After discharge from the hospital the patient went South and rested for two months in bed; she gradually increased her exercise and in another month considered herself well, excepting that she was then subject to debilitating attacks of tonsillitis. Seven months after operation she returned for examination and the metabolism was found to be normal and she appeared in every way completely cured.

In some instances complete recovery may not occur because too small an amount of the gland is removed. This is most likely to occur in the especially severe cases, whose precarious condition prevents a more extensive operation. Repeated metabolism studies will determine when the full extent of the improvement is reached, and thus furnish definite information both as to the necessity and the opportune time for the subsequent operation.

M. D., aged 21, married. Entered the hospital in March, 1916, with symptoms of very severe exophthalmic goitre. Her metabolism was determined and found to be ninety-eight per cent. above normal. Rest in bed for four weeks resulted in almost no improvement, the metabolism then being eighty-nine per cent. above normal. Partial thyroidectomy (Dr. Chace) resulted in considerable improvement. The metabolism increased to sixty-seven per cent. above normal. Patient was then discharged. After her return home she failed to rest and in addition had a very severe attack of tonsillitis. Six weeks after discharge she returned for examination. Her metabolism was found to be still very high—fifty-four per cent. above normal.

It is too early to predict the outcome of this case; it seems unlikely, however, that simple rest treatment will be sufficient. She is, however, naturally anxious to avoid a second operation; delay is advisable as long as improvement continues,—an improvement definitely determined by metabolic studies at frequent intervals.

This patient, as well as several others, received no benefit from simple rest treatment. In one case even showed an increase in metabolism.

A. E. H., aged 32, married, entered hospital in 1915, with symptoms of severe exophthalmic goitre, accompanied by a moderate degree of infection. The basal metabolism was determined and found to be fifty per cent. above normal. After operation the metabolism decreased to thirty per cent. above normal. Patient was discharged. After her return home she failed to rest and in addition had a very severe attack of tonsillitis. Six weeks after discharge she returned for examination. Her metabolism was found to be still very high—fifty-four per cent. above normal.



further rest together with x-ray treatment, the metabolism decreased to thirty-six per cent. above normal. He was then discharged and was shortly able to go to work; by letter he reports that he is doing well and is gradually getting stronger.

This patient, like A. J., probably would become entirely well under prolonged rest treatment. But he could not afford this. Economic conditions may, therefore, suggest the advisability of a second operation on those cases whose metabolism remains elevated and whose financial condition prevents prolonged rest.

The following case illustrates the opposite type of thyroid dystrophy.

M. J. B., aged 62, unmarried. Entered February, 1916. There was marked edema of the eyelids and moderate edema of the extremities. The skin was dry, but not especially thickened; almost complete loss of hair. The temperature, pulse, and respiration were subnormal, and patient was exceedingly drowsy. Urine, acid, 1.015; very slight traces of albumin; no sugar, few squamous and white blood cells; occasional red blood cells; and a few finely granular casts. Special renal tests showed very low function. Metabolism very markedly decreased to forty-seven per cent. below normal.

Under intermittent small doses of thyroid, the patient very slowly improved. Within two months metabolism had increased from forty-seven per cent. to fifteen per cent. below normal. Thyroid was then discontinued as patient was showing signs of irritability.

One month later the metabolism was again determined and found to be slightly lower—twenty-two per cent. below normal.

The clinical improvement in this patient from thyroid treatment was most marked and exceedingly striking. The albumin and casts have disappeared from the urine, and there has been some improvement in the renal function tests.

This case is most suggestive because two clinical entities were apparently present,—the myxedema and the chronic nephritis. Under thyroid treatment the myxedema greatly improved; likewise the albumin and the casts disappeared from the urine. The thyroid autacoid probably plays a very important part in regulating the protein metabolism, some of the steps of which Kendall<sup>1</sup> has recently been able to point out. It is not improbable, as in the above case, that a mild condition of myxedema may sometimes be mistaken for a chronic nephritis; in doubtful cases, therefore, the determination of the basal metabolism would materially assist in establishing the correct diagnosis.

#### SUMMARY.

1. Basal metabolism for clinical purposes can be obtained with a high degree of accuracy by collecting, measuring, and analyzing the expired air.

2. In normal people the basal metabolism rarely varies more than ten per cent. from a

normal figure, depending on age and sex, when compared by surface area, determined by DuBois' height-weight curve.

3. Several cases of thyroid dystrophies, in which the basal metabolism was determined, are cited to illustrate its value in diagnosis and in determining the proper method of treatment.

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#### V.

### PARTIAL THYROIDECTOMY WITH LOCAL ANESTHESIA, SCOPOLAMINE AND MORPHIA.

By FRANK H. LAHEY, M.D., BOSTON.

MANY of the factors in the production of exophthalmic goitre are gradually having light thrown on them by men like Dr. Kendall and similar painstaking investigators, and the knowledge gained of other ductless glands, owing to the interdependence of all, has done much to advance our knowledge of processes relating to thyroid functioning. The subject of ductless glands involves so many different fields,—chemistry, physiology, and pathology,—that other than for a trained investigator, or one interested enough in the subject to digest it patiently, the following and comprehension of the literature relating to investigations on these glands is not an easy thing. Therefore, you as clinicians may rightly say: "For us it is sufficient that the disease exists. What shall we do for it?" My answer would be, "surgery," in the light of all experience up to the present time.

The disease, untreated, has a very definite mortality,—stated by some radical writers as high as 29% in cases observed over a period of ten years,—and results in the remainder in varying degrees of incapacity and discomfort. A small percentage of cases result in spontaneous cures. Surgery offers a mortality of from 2 to 7% and a percentage of cures of from 50 to 70%, and improvement in from 20 to 30% of the remainder. To my mind there is no question that surgery offers by far the quickest and surest way to recovery. Comparing the mortality of untreated with the operated cases, it is my opinion that, even accepting the high mortality mark of 7%, the eventual risk is less with operation than with medical treatment.

Having demonstrated to myself that surgery is the treatment of choice in these cases, it became my aim to reduce the mortality of that method of treatment to its lowest possible point in my hands. So, after the occurrence of two







the right side, the gland turned bottom side up, and the capsule demonstrated and pulled away from the outer edge of the gland.

*Slide V.* Shows how the cut surface of the gland is sutured over.

*Slide VI.* Shows the relation of the portion of gland left to the whole gland.

*Slide VII.* Is a drawing of a dissection of the gland made under my direction, showing the relation of the posterior surface of the gland to the recurrent laryngeal nerves, the course of the inferior thyroid artery from behind the common carotid up to its insertion into the gland and the relation of the thyroidea ima artery to the gland.

# VI.

## THE TREATMENT OF GRAVES' DISEASE BY THE ROENTGEN RAY.

BY MALCOLM SEYMOUR, M.D., BOSTON.

[From the Medical Service of the Massachusetts General Hospital.]

THE treatment of Graves' disease by the roentgen ray has been used for many years. Uniform results have not been obtained until recently. This has been due to the inaccuracy in dosage, resulting either in no action or in serious burns, so that the treatment has been unsatisfactory and often dangerous.

The action of the roentgen ray on some of the ductless glands of the body has been observed for a long time. Its effect on the testicle and ovary is now common knowledge among the profession. Its atrophic action on the thyroid, thymus and pineal has recently received considerable study.

It is a well-established fact, that the highly specialized epithelial cells are the first to succumb to the action of the roentgen ray, and, furthermore, the more closely these cells approach the embryonal type, the more easily is their destruction accomplished. Therefore, when the pathological histogenesis of the thyroid and thymus gland in Graves' disease is borne in mind, it can readily be seen that in the roentgen ray we possess a therapeutic agent of undoubted efficacy in the treatment of this disease. This is further borne out by the large number of cases in Europe and America that have been successfully treated by men who are thoroughly familiar with the technique of roentgen therapy. F. A. Stoner treated 41 cases, with only one failure. Some of these cases were under observation from one to four years, with no sign of returning symptoms.

Ludin collected 208 articles on this subject, showing that the roentgen ray had a favorable influence on Graves' disease. In general, it was found that the longer the duration of the symptoms, the more treatment was required to cause their abatement and disappearance. He also

found that there was little foundation in fact for the claim that the rays caused such changes in the capsules of the glands that made operation difficult. It is now being noted, that frequently operations for thyroidectomy are complicated by so-called thymus deaths or status lymphaticus. Most surgeons insist that the thymus should be investigated and resected at time of operation so as to prevent the above condition.

We have, at the present time, under treatment at the Massachusetts General Hospital, 144 cases of Graves' disease. Treatment of most of these cases has been going on since August 1, 1915. Of these 144 cases, 80 have been given at least two treatments. The average number of treatments received has been four. The duration of the treatments has been from two to eight months, the average being three and one half months. Of the 80 cases which have been treated, all have shown improvement with the exception of seven. Of these seven cases, three have received two treatments, three have received three treatments, and one has received four treatments. In one of these cases the disease is complicated by asthma, and one has active pulmonary tuberculosis. Five cases showed no change. Four were born in Russia, and although the pulse rate is lowered and the tremor has largely disappeared, they will not admit that they are improved, and complain of indefinite aches and pains throughout the body. One case has had three treatments, and shows absolutely no change. Of the eighty cases, eight were absolutely cured of their symptoms. Nearly all have gained in weight. The average gain has been seven pounds, one case having gained twenty-five pounds. The pulse rate has been lowered in all but a few cases, the average being twelve beats. The greatest lowering in pulse rate was 52 beats, from 146 to 94. In this patient, the symptoms were very severe, with marked exophthalmos and tremor, and a moderately enlarged tumor of the gland. She had five treatments. The tremor has disappeared, the exophthalmos has practically gone, the circumference of the neck decreased one-half inch, and she feels perfectly well.

The method of treatment has been as follows: The neck has been divided into three areas,—right, left and middle or suprasternal,—and the treatment directed to these areas. A Coolidge tube has been used. The average dosage has amounted to about 4 II., which equals 5 Holzknecht or 10x Kienbock or 13 Salmonaud-Noire. This is the dose necessary to produce a slight erythema. Some writers state that an erythema dose is too severe, but we have not found this to be so. It seems advisable, however, to keep just below the erythema dose so as not to cause any skin irritation, inasmuch as it seems evident that repeated erythematous doses may cause vessel changes in the skin covering the tumor, or the tumor itself.



In all cases, the target of the tube was at a distance of 10 inches from the skin, and a filter of 4 mm. of aluminum and 1 thickness of sole leather was interposed. The dose has not been repeated inside of three or four weeks. Under general treatment, most of the patients have not changed their modes of living, excepting the diet, which has been increased or favorably rearranged, and treatment has been directed towards anemia, which has been present in a considerable number of cases.

The diseases of the thyroid gland have recently been studied with particular interest, since the level of the total metabolism seems to be the best index of the activity of the thyroid secretion. DuBois found in a cretin who was 36 years old, the total energy requirement was from 18 to 25% above the normal, but was raised almost to the normal on the third day of treatment with thyroid extract.

In a recent study of the metabolism of hyperthyroidism, Dr. J. H. Means, of the Massachusetts General Hospital, has found in a series of nine cases of typical exophthalmic goitre, that the metabolism in all of them showed a marked rise, anywhere from 30 to 80% per square meter of body surface, using the DuBois formula for surface area of body, and still more per kg. of body weight, this latter being due to the great emaciation which many of them show.

This marked rise in hyperthyroidism is very interesting because, so far as is known, so marked a rise occurs in no other condition in which fever is not present. These patients were all afebrile when studied.

In addition to the fact that an increased heat production is a characteristic of hyperthyroidism, there seems to be good evidence that the severer the intoxication, the higher the metabolism.

During the study of these cases, our attention necessarily centered on the region of the body nearest the thyroid gland, and in making the routine observations as to size of the gland, etc., various bony abnormalities were encountered. Five cases of extra-cervical ribs were observed among the 144 cases studied, four being found during the physical examination, and one by the x-ray. All were without symptoms which might have been caused by this abnormality.

#### CONCLUSIONS.

All writers on the subject of x-ray treatment of hyperthyroidism have come to the following conclusions: The pulse rate is nearly always reduced, and this, almost always at once. The tremor and nervous symptoms improve from the start. The gland rapidly diminishes in size in some cases, remains unaffected in others, but if hard, tense and throbbing, the throbbing diminishes and the gland becomes softer. The body weight practically always immediately increases.

Advantages of this treatment:

1. There are no fatalities.
2. There is no resulting scar, as after operation.
3. It does not interfere with the patient's occupation.
4. It is painless and causes very little inconvenience to patient.
5. If unsuccessful, an operation may be done with less risk, because of the favorable action of the x-ray on the thymus gland.

The x-ray treatment of Graves' disease should not be undertaken except by those thoroughly experienced in roentgen therapy. The dosage must be accurately measured, for if the rays are applied in a haphazard manner without knowledge of the total dosage, the result may be unsatisfactory, resulting in serious burns or in total destruction of the gland, causing myxedema.

The diagnosis of hyperthyroidism is frequently overlooked, and is mistaken for so-called neurasthenia, and is especially confused with early pulmonary tuberculosis.

#### Original Article.

#### THE EXCRETION OF HEXAMETHYLENAMIN BY DAMAGED KIDNEYS.\*

By GEORGE GIBBERT SMITH, M.D., BOSTON.

(From the Genito-Urinary Department, Massachusetts General Hospital.)

In the management of renal infections, the medical profession has been accustomed to place considerable confidence in hexamethylenamin. This drug is excreted by the kidney and is broken up by acid urine into ammonia and formaldehyde. Despite the conclusions of some investigators, who allege that the splitting off of formaldehyde does not occur until the urine has reached the bladder, clinical experience has taught some of us that renal infections of the most severe type can be controlled and perhaps cured by the administration of urethane.<sup>1</sup>

It is somewhat disturbing, therefore, to read in a paper by Falk and Sugrue,<sup>2</sup> dated 1920, the statement: "Research conducted by the Rockefeller Foundation has shown that the pathological process of pyelonephritis is characterized by a marked impairment of the excretory function of the kidney, and that the excretion of hexamethylenamin is markedly reduced in such cases." It is not surprising, therefore, that the authors of this paper should have

\*Read before the Boston Society for Medical Progress, April 22, 1922.

<sup>1</sup>See Smith, G. Gibbert, "The Treatment of Renal Infections," *Ann. Surg.*, 1922, 75, 1.

<sup>2</sup>Falk, R. and Sugrue, J. "The Excretion of Hexamethylenamin in Pyelonephritis," *Ann. Surg.*, 1920, 71, 1.



true, urotropin must be placed on the shelf along with the other false hopes of the pharmacopeia.

It seemed to us important to investigate this question. In the first place, upon what evidence do Falk and Sugiura base their conclusions?

They determined the quantity of urotropin by a method which depends upon the precipitation of urotropin by the addition of an alcoholic solution of iodine. This test does not take into consideration the free formaldehyde which may be present (personal communication from Falk).

This seems to us a possible source of error. Some of the specimens were examined by Falk and Sugiura a good many hours (at least 20) after they were voided. During this period, if the urine were acid, a splitting-up of the urotropin present undoubtedly was going on. The writers partially cover this point by saying that if the test for hexamethylenamin is "negative or doubtful, the test is confirmed by acidifying a few cubic centimeters of the solution with sulphuric acid, warming, and then testing with phloroglucin and alkali for formaldehyde." The absence of the latter, they conclude, "proves conclusively the absence of hexamethylenetetramin."

We would answer this point in two ways. First, they apply this acidifying test only when the test for urotropin is "negative or doubtful." If urotropin is present in small quantities, they do not use this control. Secondly, the test for formaldehyde which they employ seems inadequate. In the 40 observations on normal urines given by them, there is one strong test for formaldehyde, one "faint to strong," and three "fair." All the others are faint, very faint or negative. The work of Burnam and my own work upon the question of the presence of formaldehyde in urine gave a much larger proportion of positive results. We used the phenylhydrazine, sodium nitro-prusside and sodium hydrate test; they used the phloroglucin and alkali test.<sup>1</sup> The point is a difficult one to make clear without further data, but it seems that if the test used by Falk and Sugiura gave only 5 positive results out of 40 observations on normal urine, it cannot be relied upon as a control for the excretion of hexamethylenamin.

If the urine to be tested contains albumin, it must be submitted to the following process before the estimation can be made. "An equal volume of methyl alcohol is added, the mixture allowed to stand one or two hours at room temperature, filtered by decantation through folded filter paper, evaporated to one-third the volume in a current of air or under diminished pressure."

It has been shown that urotropin dissolved in acid urine and allowed to stand for several

hours at room temperature will be partly broken up, and that the urine will then give a definite test for free formaldehyde. It seems to us highly probable that during the process of filtering and evaporation, through which albuminous urines are put in Falk and Sugiura's test, the urotropin, at least in part, is converted into formaldehyde, and the latter, being simply a gas in solution, escapes. Urine from damaged kidneys is usually albuminous; it is this urine which is subjected to the preceding test. These investigators do not mention control experiments upon normal urine to prove that the process does not drive off urotropin in the form of formaldehyde; it appears to us justifiable to believe that the test itself, which is not the same for normal and for albuminous urines, may be one cause of the apparently diminished urotropin content in urine from damaged kidneys.

Falk and Sugiura applied their quantitative test for urotropin to the urines of various normal individuals, and found that the ingestion of one gram of urotropin was followed by the excretion in the urine of quantities of the drug varying from 11% to 74% of the amount ingested; that in general the absolute amount of urotropin excreted by the kidneys increased as the specific gravity of the urine decreased. "The lower the specific gravity of the urine, the larger was the amount of hexamethylenetetramin excreted." They do not attempt to explain this phenomenon, but apparently regard it as being connected in some way with the kidney. They do mention the possibility of its being due to differences in the absorption of the drug by the gastro-intestinal tract. To us, this seems to be the explanation. The normal kidney is remarkable for the uniformity of its work; upon this quality the various functional tests depend. To secure uniform results, however, a definite quantity of the substance used must be introduced into the blood-stream; the factor of absorption from the gastro-intestinal tract at once diminishes the accuracy of the test as a measure of renal function.

It is highly improbable that the healthy kidney which excretes the test drugs with such uniformity, behaves in so capricious a manner towards hexamethylenamin. It is highly probable, on the other hand, that varying conditions in the gastro-intestinal tract—the presence of food, the acidity of the gastric juice, the amount of fluid in which the drug is diluted—alter in the same individual the amount of urotropin which is absorbed. Quite possibly the ingestion of much water aids in the absorption of urotropin, thus accounting for the observation that high urotropin excretion and low specific gravity go hand in hand.

The low output of urotropin by some of the pathological cases cited by Falk and Sugiura may be due to conditions affecting the metabolism of the entire body, such as anasarca or a state of impending death, which must have

<sup>1</sup> In my experience, Burnam's test has shown itself three or four times as delicate as the phloroglucin test. This does not agree with the findings of Hanzlik and Collins, who consider phloroglucin the more delicate. (Hanzlik and Collins, *Arch. of Int. Med.*, 1913, Vol. 12, p. 578.)



greatly diminished the absorptive powers of the stomach and intestines.

The output of the drug was studied by Falk and Sugiura in 24 pathological cases. One gram was given, and the urine collected for the next 12 or 24 hours. Nine of the cases (15, 17 to 24) were under treatment for diseases—tuberculosis of the knee, leukemia and syphilis of the brain for example—which had no particular connection with the kidneys; three others, (13, 14, and 16) had arteriosclerosis, which might possibly have had renal manifestations. Of these 12 cases—half the series—there is no evidence presented to show that there existed any real damage of the renal tissue. In three of them, indeed, we are told nothing whatever about the renal condition. Yet of these 12 cases, only two show an output of urotropin greater than 13%. Four of them show only a trace.

The other 12 cases are all renal—one nephropsis, one septic infarct (unilateral), one amyloid kidney. The other nine are chronic interstitial or cardio-renal cases. They excrete urotropin rather better than do the twelve with healthy kidneys—27%, 86%, 79%, 24%, 61% are the five best outputs. Of the others, two who died put out only a trace, and one with a retained nitrogen of 164 and a phthalein test of 0, put out none.

Careful study of this series of observations fails to show any constant relation between the renal condition and the output of urotropin. The amount of urotropin excreted averages less than in the series of healthy kidneys; that may be due to the effect of the test itself when applied to albuminous as contrasted with non-albuminous urines, or may be due to the poor absorptive powers of many of the pathological cases. One would hardly expect a patient in the last stages of leukemia to have a very robust metabolism.

The evidence produced by Falk and Sugiura does not warrant the conclusion that damaged kidneys do not excrete urotropin in sufficient quantity to be of bactericidal value.

In order to test this point still further, we have examined the urines of 14 patients whose kidneys were unquestionably damaged, many of them to a marked degree.

Not being proficient enough to employ the test used by Falk and Sugiura, we have had to rely upon the test for formaldehyde described by Burnam. As a rough measure of the concentration of the formaldehyde, positive urines were diluted until they no longer gave a positive test. The last dilution giving a definitely positive test we took to be a 1:300,000 solution, since formaldehyde added in known quantities to normal urine ceased to give a positive test when diluted beyond this point. By dividing 300,000 by the number of dilutions, the approximate strength of the original solution was arrived at. This method, unfortunately, was suggested only towards the end of the investigation and was employed only in a portion of the cases.

The cases studied fall into two groups:

- (1) the "surgical" kidneys resulting from renal calculus, obstructing prostate, etc., and
- (2) the "medical" nephritis of chronic interstitial or glomerular type.

Ten cases with kidneys damaged by infection were studied. The evidence of bilateral damage was found in the decreased phthalein output plus the clinical history. Seven of them were old men of the prostatic class; one was a bilateral pyelitis, one bilateral renal calculi, one a rather obscure case of a septic infarct or eclamptic kidney. The prostates had been taking urotropin gr. x four times a day for varying periods; the others had been given gr. xv three or four hours before the urine was collected. Of these 10 cases, the urine contained free formaldehyde either before or after boiling with sulphuric acid (depending largely upon the acidity) in quantities sufficient to give a moderately positive test (dark green with Burnam's method) in 4 cases, and a strongly positive test (bluish or blackish green) in 6 cases. Of the strongly positive cases, the strength of formaldehyde present, estimated by the dilution method, was 1:40,000 once, 1:30,000 twice, 1:10,000 three times. The strength of the moderately positive tests was probably not more than 1:60,000 to 1:100,000.

Perhaps the case most strikingly illustrative of the ability of damaged kidneys of this type to excrete urotropin was that of Mrs. L., aged 52, whose x-rays showed huge calculi in both kidneys. After the intramuscular injection of 1 c.c. phenolsulphonephthalein solution, no color appeared in the urine for 35 minutes. In the hour following the appearance of the color, less than 5% of the dye was excreted. She had been taking urotropin gr. xv three times a day for several weeks, and the urine showed a urotropin content of at least one part in 10,000.

From the study of this group of ten cases, all of whom had that type of kidney disease which is usually treated by urotropin, we do not find evidence that the output of urotropin is reduced below the point of efficiency.

Examination of four cases of the nephrotic type, however, gave different results.

CASE 1. Age 58. Chronic nephritis, type 1, with phthalein excretion of 0.000001 after the second hour, not proteinuric. After the administration of one dose of gr. xv urotropin, the urine contained free formaldehyde in a quantity sufficient to give a bluish blue color.

CASE 2. A patient with chronic nephritis, type 1, first seen at the Boston Hospital for Diseases of the Kidney, in 1914, with a phthalein excretion of 0.000001 after the second hour, not proteinuric. After the administration of one dose of gr. xv urotropin, the urine contained free formaldehyde in a quantity sufficient to give a bluish blue color.

CASE 3. Age 58. Chronic nephritis, type 1, with phthalein excretion of 0.000001 after the second hour, not proteinuric. After the administration of one dose of gr. xv urotropin, the urine contained free formaldehyde in a quantity sufficient to give a bluish blue color.



and 74 mgm. non-protein nitrogen, put out only the slightest trace of urotropin 10 hours after a dose of gr. xv, and none at all after two doses 16 and 4 hours previously.

CASE 4. A man of 46, with probable bilateral polycystic kidney, phthalein excretion of less than 5% in two hours, and non-protein nitrogen of 97 mgm., excreted only a small amount of formaldehyde (moderately positive test); this appeared 5 hours after ingestion of the drug.

In a previous paper on the excretion of formalin in the urine, I stated that "the kidneys of chronic nephritis, to judge from a few observations, excrete urotropin much more slowly than do normal kidneys. One dose of grains xv has given traces of formaldehyde in the urine for 36 hours." From the very limited number of cases of nephritis which we have studied in this connection, it would appear that serious disease of the glomeruli greatly decreases the ability of the kidney to excrete hexamethylenamin. If this is true, the diminished excretion of this drug in chronic glomerulo-nephritis should not affect the position of hexamethylenamin in the treatment of renal infections. According to Cabot and Crabtree, colon infection affects the epithelium of the tubules. Excretion of hexamethylenamin by the glomeruli is not interfered with, and the drug, as we have shown, is put out in good quantity.

In view of the above findings, we believe that the statement of Falk and Sugiura in regard to the low output of hexamethylenamin by kidneys with impaired function is of very little practical importance. Close analysis of their paper shows several probable sources of error in their procedure, and these errors all tend to represent the urotropin output as less than it really is. Of the 24 pathological cases studied by them, 12, or one-half the number, fail to present evidence of any value pointing to true renal disease. These 12 cases, furthermore, show a lower output of urotropin than do the 12 cases of renal disease in the same series.

No conclusions as to the value of urotropin in those cases in which it might be expected to do good can be drawn from the work of Falk and Sugiura.

As positive evidence on the question of the output of urotropin by infected kidneys we have presented facts drawn from a study of 10 cases of undoubted renal disease of this type. In every case urotropin was excreted; in three cases, in a strength of 1-10,000; in two, 1-30,000; in one, 1-40,000. It was weaker in the other four, although strong enough to give a definite test with Burnam's method. In chronic nephritis of advanced degree, we have found in three cases a diminution in the output of urotropin which would be a serious factor in its employment as a therapeutic agent. Fortunately, in such cases it need seldom be employed. In kidneys damaged by infection, even to a very marked degree, the drug may be excreted in a strength as high

as 1-10,000. One must bear in mind the very important fact that no matter how much urotropin is excreted, it will be useless as a bactericide unless it is broken up into formaldehyde by urine which is definitely acid.

We wish to acknowledge our indebtedness to Dr. W. Denis, Director of the Chemical Laboratory at the Massachusetts General Hospital, for much valuable assistance, and to the Medical Staff for the use of their cases.

## THE ILEO-CECAL VALVE AND THE CHRONIC INTESTINAL INVALID.

A PRELIMINARY NOTE ON VALVULAR INCOMPETENCE WITH CASE REPORT DEMONSTRATING SUCCESSFUL NON-SURGICAL THERAPY.

BY JOHN BRYANT, M.D., BOSTON.

THE existence of the ileo-cecal valve was first noted by Posthius in 1566; four years later, Varole stated that its function was to prevent regurgitation of faeces into the small intestine. Piccolomini in 1586 produced experimental incompetence of the valve. Good, 336 years later, stated that the second main function of this muscular valve is to moderate the flow of the contents of the small intestine into the colon. After an additional 75 years, Hertz in 1897 recognized clinically the existence of incompetence of the valve, and treated it medically with some success.

Cole, in 1902, demonstrated incompetence by the bismuth-roentgen method, and has since stated that clinical symptoms vary in intensity with the degree of incompetence present. Macewen in 1904, on the basis of direct observation in the human, deduced the existence of the pyloro-ileo-cecal reflex, later proved by the physiologists; he also clearly described a type of indigestion resulting from too rapid passage of food products through the valve, and described the effects of mental states upon its action.

Yet, for the most part, knowledge of the ileo-cecal valve has been conspicuous by its absence. Thus, even standard anatomies of today are content to perpetuate error in the little they do say about it, by dismissing the valve as a purely mechanical affair.

The last three years, however, have seen a renewal of interest in the actions of this small but interesting structure, as witness the writings of Kellogg, Case, Cannon, Elliott, Rutherford, and others. It is at least now proven that the ileo-cecal valve

- I. Is normally competent after infancy.
- II. Should constitute an effective break in continuity between the very dissimilar, even if adjacent, processes of putrefaction and absorption.



- III. Is an active muscular as well as a passive mechanical structure.
- IV. Is responsive to both nervous and chemical stimuli.
- V. Is exposed to possible destructive distensive pressure from above, below, or both.

It is also established that the valve is frequently unable to withstand the strains to which it is subject, since various able roentgenologists have reported it incompetent in the proportion of one case in five.

Also, incompetence, when found, may not be dismissed as harmless and unimportant, or merely as a symptom pointing to something else. It has, on the contrary, been proven by Kellogg and others to be a direct cause of disagreeable symptoms from which the patient may properly expect to obtain at least some measure of relief.

What is the real frequency of incompetence? When found, is it congenital or acquired, and in what proportion? How often is medical treatment adequate? May it ever restore the valve to actual competence? These and other questions await solution; the valve has been as yet too infrequently an object of careful study.

A growing personal experience, however, would seem to justify the following assertions:

I. In the mild or ambulant group of chronic intestinal cases, the frequency of incompetence may be distinctly in excess even of the accepted ratio of one to five.

II. When present, incompetence should be treated as an undesirable pathologic entity; an entity however usually responsive to intelligent treatment.

III. Under adequate medical treatment the patient may be assured at least some degree of improvement, with corresponding alleviation of symptoms; surgery is only secondarily indicated.

IV. Medical treatment may even restore the valve to complete competence.

V. The progress and results of treatment are under absolute control, through the agency of the bismuth-roentgen meal and enema.

Case has said, "once incompetent always incompetent." But this cannot always hold true, as witness the following case report, in which it is especially desired to focus attention upon the roentgen notes by Dr. Dodd. For though the possibility has been inferred, a moderate search of the literature has revealed no such actual proof of the restoration to complete competence by non-surgical means, of a valve previously demonstrated incompetent.

Mr. S., age 61, height 5 ft. 11 inches, weight 205 pounds. Formerly a powerful athlete, Mr. S. had become soft and heavy without losing his intellect. Since childhood he had suffered from nervous headaches induced by excitement, as I had some of those of his family. When first seen on Oct. 5, 1915, he complained of rapid exhaustion of energy, especially during the night, and of a peculiarly fitful sleeping after 3 A.M., cold limbs and feet, subnormal temperature and constant uneasiness, particularly of spells of abdominal discomfort associated

with right iliac pain and excessive gas in the intestines; the spells always were aggravated by being tired, and lasted a month or so at a time.

Examination showed fatigue posture, eyes and skin yellowish, lower lips puffy, fat pads above the clavicles, large relaxed abdomen, and moderate chronic edema of the ankles; thorax full, lungs negative; heart large but competent; abdomen flat or wind, tympanic throughout, pain and excessive peristalsis on pressure over the right iliac fossa, knee jerks very lively; all muscles of the arms very active; mentally introspective, easily depressed, pulse 70; blood pressure 165/120; are normal except for the S. p. of albumen long known to be due to a mild chronic interstitial nephritis. Roentgen examination, Oct. 7, by Dr. Dodd, showed a large transverse heart and dilated arch of the aorta, dilated cecal and colonic stasis, and an incompetent ileocecal valve.

Under treatment the posture became erect, the skin and eyes cleared, the edema of the ankles disappeared; the weight dropped 22 pounds, to 183, the puffiness under the eyes markedly decreased, as also the fat pads over the clavicles; the abdomen became inches smaller, and its muscles firm; the bowels became regular, and abdominal discomfort from gas or pain practically ceased. On April 1, Dr. Dodd reported that a "bismuth enema did not reveal any evidence of an incompetent ileocecal valve." The cardio-renal condition remained about the same, but bowel disturbances had by then been practically eliminated. Mr. S. had become fixed in his new habits of health and diet. Throughout the past summer he has remained "remarkably free from discomfort." At the end of September he had a slight recurrence of his intestinal trouble, following upon several days of physical over-exertion. He had, however, learned how to care for himself, and speedily recovered.

There are many cases of the type described. They may, without great effort, be restored to a condition of mind and body which will give promise of an enjoyable and useful old age, rather than a too early demise.

Diagnosis of ileocecal incompetence is also made by means of roentgenoscopy. In the present stage of development of the science it is as practicable to omit roentgen study of an intestinal case which does not readily react to treatment, as it is to neglect a Wassermann test in an appropriate case. Given a case with chronic intestinal history, with local pain, excessive peristalsis on pressure over the right iliac fossa, excessive gas formation not easily relieved by constipation, stasis, and evidence of excessive distension, a presumption of valvular incompetence is indicated which should be checked by roentgenoscopy. The toxic symptoms, excessive gas formation, and flat-headedness, fatigue, excessive peristalsis, and distention of the right half of the colon, the local pain, the fitful sleep, and the cold limbs and feet, the subnormal temperature, and the constant uneasiness, especially of spells of abdominal discomfort associated with right iliac pain and excessive gas in the intestines, are all symptoms which may be expected to respond to intelligent treatment. The temperature, pulse, and blood pressure, and the condition of the heart, lungs, and kidneys, should be watched, and the patient should be kept in bed, and the bowels should be kept regular by the use of the bismuth-roentgen meal and enema. The patient should be kept in bed, and the bowels should be kept regular by the use of the bismuth-roentgen meal and enema. The patient should be kept in bed, and the bowels should be kept regular by the use of the bismuth-roentgen meal and enema.



It is obvious that, for example, cold extremities and subnormal temperature may have other explanations, and in fact in the above case they were at least partly due to the mild hypothyroidism so common in stout elderly persons. But should all or most of the symptoms mentioned be present, the burden of proof that the valve is not incompetent, rests at least with the practitioner who refuses to his patient the benefit of a skilled roentgen examination.

Treatment will be considered later. Evidence has, however, been presented which suggests that treatment directed toward the relief of incompetence of the ileo-cæcal valve may be worth while, since it may result in distinct improvement in the health of the patient.

### Book Reviews.

*Pulmonary Tuberculosis.* By MAURICE FISHBERG, M.D. Philadelphia and New York: Lea and Febiger. 1916.

This volume, consisting of over 600 pages and containing many excellent diagrams, illustrations and plates, is the latest addition to the literature, already voluminous on the general subject of tuberculosis. In view of the recent comprehensive works on this subject, it is manifest that little new can be added, so that what we already know can merely be presented in new and attractive style. Dr. Fishberg states that an experience of 18 years is convincing that careful home treatment is productive of practically the same immediate and ultimate results as institutional treatment, and is less costly to the patient and to the community. The reviewer is of the opinion that the vast majority of workers in the field of tuberculosis would not agree with this statement, and that this point of view cannot possibly be maintained or proved. Dr. Fishberg very wisely calls attention to the fact, becoming of more importance every day, that not everyone infected with tuberculosis is destined to become sick, and that a sharp distinction must be made between tuberculous infection and tuberculous disease. Likewise, speaking of the value of the X-ray in diagnosis, he calls attention to a similar point that the X-ray does not necessarily give conclusive proof that the patient is sick, and in need of prolonged and costly treatment. In his chapter on percussion, he wisely states that dullness alone, without any general symptoms of phthisis, proves nothing, just as in radiography, a shadow over an apex does not prove an active tuberculous lesion. In his chapter on auscultation, the reviewer is glad to see proper value given to the whispered voice. The value of the X-ray, which many enthusiasts have considered to be very great even in the incipient stage of phthisis, Dr.

Fishberg points out to amount to very little except in the rarest of instances. In speaking of medicinal treatment, he devotes several pages to the use of creosote, ichthyol and arsenic. The reviewer is of the opinion that reference to these drugs in the treatment of pulmonary tuberculosis, except that they are of no value, whatsoever, and usually do harm, might well be omitted. With the exceptions mentioned, especially as to the value of home treatment versus treatment in a sanatorium, with which many will disagree, the book can be highly recommended. It contains an immense amount of information, representing much work clearly and attractively presented.

*Medical Hints for the Use of Medical Officers Temporarily Employed with Troops.* By J. EDWARD SQUIRE, M.D. London: Oxford University Press. 1915.

This is one of a series of war primers published by the Oxford University Press. It attempts to cover the medical problems which confront the physician of civil life who enters the army. Within the scope of 120 odd pages it is obviously impossible for the author to attempt more than a cursory survey of the medical conditions met with in active army life. The book is occasionally marred by the use of such an obsolete expression as "pleurisy is commonly caused by chill." Preventive and sanitary measures receive rather scant consideration. The book does reflect, however, the large personal experience of the author in the care of sick soldiers.

*The Basis of Symptoms, the Principles of Clinical Pathology.* By DR. RUDOLPH KREHL. Authorized translation from the Seventh German Edition. By ARTHUR FREDERIC BEIFELD. Third American edition. Philadelphia: J. B. Lippincott. 1916.

Two earlier editions of Professor Krehl's "Pathologische Physiologie" were translated by Dr. Hewlett, and are well known under the title of "Clinical Pathology."

It is somewhat hard to understand why the translator in changing the title did not adopt a literal translation, since pathological physiology represents the subject-matter of the book. This work has now reached seven editions in German and the translator has continued Dr. Hewlett's great service in making this edition available for American readers. It is not necessary to dilate with enthusiasm upon this admirable, stimulating book, even on the excuse of the appearance of a new edition. The same general outline of the previous editions is followed and the treatment is essentially the same. The translator has done his work well and occasionally helps the text by discriminating parenthetical remarks.



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## NEW ENGLAND SURGICAL SOCIETY.

The first annual and inaugural meeting of the New England Surgical Society was held in Boston on October 5, 6, and 7, under the presidency of Dr. Samuel J. Mixer of this city. The sessions were held at the Harvard Medical School, at the various Boston hospitals, at the Harvard Club and at the Copley-Plaza Hotel.

At the initial meeting at the Harvard Medical School on the morning of October 5, there were papers by Dr. John W. Churchman of New Haven, Conn., on "A Group of Injuries in Modern Warfare," and by Dr. Edward P. Richardson of Boston on "Jejunum After Following Posterior Gastro-entostomy." There was a symposium on the large intestine, with papers by Dr. Homer Gage and Dr. Ernest L. Hunt of Worcester, Dr. Peer P. Johnson of Beverly, Dr. John W. Keefe of Providence and Dr. Frank H. Lahey of Boston. There were demonstrations and operative clinics at the

Children's Hospital, Free Hospital for Women, Massachusetts General Hospital, Carney Hospital, Peter Bent Brigham Hospital, and the Boston City Hospital. On Friday afternoon there was a second literary session at the Harvard Medical School and in the evening a dinner at the Harvard Club, at which the presidential address was delivered. The complete proceedings of the New England Surgical Society will be published in later issues of the JOURNAL, which is its official organ.

The New England Surgical Society was organized early in 1916, with a membership of 75 representative surgeons from the six New England states. It comprises a group from Portland, Maine, representing the Bowdoin Medical School; a group from Burlington, Vt., representing the University of Vermont; a group representing the Dartmouth Medical School, a group from Providence, R. I.; a group from the Yale Medical School and other surgical centers in Connecticut; and a large group from Massachusetts. During its initial year the officers of the Society have been as follows: President, Dr. Samuel J. Mixer of Boston; Vice-president, Dr. John B. Wheeler of Burlington, Vt.; secretary and treasurer, Dr. Philenon E. Truesdale of Fall River, Mass. The executive committee has consisted of Dr. John W. Keefe of Providence, R. I.; Dr. Joseph M. Flint of New Haven, Conn.; Dr. Lyman Allen of Burlington, Vt.; Dr. Herbert L. Smith, Nashua, N. H.; and Dr. William L. Cousins of Portland, Me.

The Society will meet but once a year, in the leading New England cities successively, and at each annual meeting will make a special effort to obtain from its members their most recent and best productions. The arrangements for this first meeting in Boston were under the able management of a committee consisting of Dr. William P. Graves, Dr. Charles A. Porter, Dr. Fred B. Lund, Dr. John T. Bottonby, Dr. David Cheever, and Dr. Charles G. Mixer. Upon the occasion of this meeting, which was well attended and met with a notable degree of success, the JOURNAL takes pleasure in extending its cordial good wishes to the New England Surgical Society, whose activities should lead not only to the production of valuable scientific material in surgery, but to the closer cooperation and mutual acquaintance of practitioners in surgery in the large hospital centers throughout New England.



## ELIMINATION OF THE RAT.

IN the issue of the JOURNAL for September 21, 1916 (Vol. clxxv, p. 397), we published, with editorial comment in another column, an important paper by Dr. Mark W. Richardson of Boston, formerly secretary of the Massachusetts State Board of Health, advancing the theory of the transmission of poliomyelitis through the agency of the rat flea. Immediately following the publication of this article, a movement was initiated by the Women's Municipal League of Boston for the extensive destruction of rats in this city. This movement was originated by Mrs. Robert S. Bradley, and will be carried out under the management of Mrs. Albert T. Leath-erbee. Circulars and posters have already been issued, and the following statement of its purposes has been made by the League:

"Aside from its menace as a pathological agency, the economic loss due to rats is enormous. This creature is omnivorous and otherwise destructive, and there is no known commodity of manufacture and commerce that it does not injure. Government experts have officially proclaimed that rats consume property to the extent of \$1.82 each per year, and that their number equals the human population. The rat is a menace to buildings in its liability to gnaw out supports and foundations, unless thoroughly rat-proofed, and in its ability to cause fires through gnawing of matches and the insulation from electric wires—which last item is computed to cost the underwriters about \$15,000,000 yearly. The Women's Municipal League intends to go about this matter in a perfectly practical manner along lines already proved effective. It will form rat clubs, which will work in co-operation through the entire city, which clubs will be instructed by competent rat catchers in the most desirable and effective methods of rat extermination. In this work they have the hearty support of the Mayor and the City Administration, and the endorsement and official co-operation of the City Board of Health. To prosecute properly this undertaking, it will be necessary to raise funds from public subscription, but as rats are destroying nearly one and one-half million dollars of property yearly in the city, the League feels that the people should be glad to subscribe a few thousands on this work, realizing that every rat killed means the extinction of its progeny, which are to be figured in the hundreds yearly. While they hope that it may be possible with time, the enactment of proper ordinances and the general education of the people as to the true habits of rats, to make the city ratless, they know that much can be done now in exterminating large numbers. If San Francisco could in a few months destroy over 500,000, surely Boston can

do as well. They hope for the generous support of the citizens."

Whether or not Dr. Richardson's theory is proved correct, that poliomyelitis is transmitted through the agency of the rat flea, it is well recognized by physicians that the rat, from many aspects, is an important menace to the health welfare of the community. The Women's Municipal League, therefore, deserves and will receive the cordial commendation and support of physicians in its efforts towards the elimination of the rat for the benefit of the public.

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 COLORED THINKING.

WE all have ways peculiar to ourselves of visualizing abstract conceptions. Sometimes these are due to aids to memory which we used in learning such educational elementaries as the alphabet, the multiplication table, the months of the year, etc., or they may be due to certain fortuitous associations. Thus the particular color a letter was painted in the picture book studied by a child may determine his chromatic conception of that letter through life. Or the object used to illustrate each letter may be associated in the same way: A, with apple; B, with banana; C, with cherry and so on. We know a physician who thinks of the numbers one to twenty as a sort of ladder; after twenty there is an abrupt descent and the numbers climb again to thirty, which is a little higher than twenty; this process is repeated with each set of ten and when 100 is reached this is thought of as several small hills close together. A thousand is represented by a large orchard and a million is just something very bright, but has no more definite appearance.

Probably the commonest way of representing abstract ideas is by color—indeed, it is doubtful whether any of us is entirely without a little of this chromatic thinking. In some individuals it is so pronounced that each numeral has its distinctive color. Sounds, tastes, and emotional affects all have their chromatic representation to such persons. In a recent paper Professor Blanchard<sup>1</sup> proposes for this psychic phenomenon the term "chromatic encephalopsy." We have been accustomed to refer to it merely as "thinking in color." It is as yet a question whether or not there are any other psychic peculiarities associated with it. Dr. Fraser Harris,<sup>2</sup> writing in 1908, states that these peo-



pie, whom he calls, after Galton, "psychochromæstheses" or merely "seers," are "as a rule rather above than below the intellectual average." According to Havelock Ellis,<sup>4</sup> women have this faculty more frequently than men.

The chief characteristics of chromatic conception were laid down by Sir Francis Galton in 1883, and have been in the main confirmed by other observers. They are as follows: First, these associations between concepts and colors have been formed at a very early age. Second, these concepts are distinctly individual; thus the letter "S" may be white to one person, green to another, blue to another, and so on. Only by coincidence, as it were, do two persons have the same psychogram. Third, these conceptions are definite and change very little in the course of time. Such changes as occur are not very radical either, that is, white may change to silver and silver to gray, but never white to black. Fourth, this mental faculty is hereditary, as much so as Huntington's chorea.

It is impossible to tell the exact personnel of the distinguished company in which the psychochromæsthete finds himself, for it seems difficult to get persons to admit this form of thinking, probably on account of an impression that it is a childish sort of thing. However, we know that the following persons may be listed as being "seers": Sir Francis Galton, the scientist; Ellen Thornycroft Fowler, the author; Dr. Head, the neurologist, the Rev. S. Henslow, the botanist, and Baudelaire, the French poet. These are undoubtedly only a few of the eminent persons thus endowed, but as time goes on and more is learned about this faculty, it is possible that some of its implications will be so creditable that we shall find persons boasting of it instead of concealing it, as is often the case now.

## REFERENCES.

<sup>1</sup> Bulletin de l'Académie de Médecine, No. 21. Séance du 23 Mai, 1916.

<sup>2</sup> Colored Thinking, by D. Fraser Harris, M.D. *Journal of Abnormal Psychology*, June-July, 1908.

<sup>3</sup> Enquiries into Human Faculty, by Sir Francis Galton.

<sup>4</sup> Man and Woman, by Havelock Ellis, rev. ed., p. 159.

case of Australia, as evidenced by the "Health Act Amendment Act," which has recently become a law by receiving the Royal approval. It is directed against venereal disease, and is extremely drastic in its provisions. It provides that no one except a doctor shall attend such cases, penalty \$250; a person knowing or suspecting that he has such a disease shall put himself under medical treatment, penalty \$100; physicians must report such cases, penalty \$25; they must also report failure of the patient to attend for six weeks, give written warning to the patient of the danger of the disease, with special cautions against marrying, penalty of non-observance of each of these rules, \$25; parents of children under sixteen must answer for them, penalty, \$50. Furthermore, should the Commissioners of Public Health receive the information that any one is suffering from venereal disease he must require that person to furnish a certificate from a physician that it is, or is not, true; if for any reason he feels dissatisfied with this certificate he may require a health officer or two private doctors to examine the suspect. The health commissioner is also authorized to arrest and detain any person suffering from venereal disease for two weeks if he thinks that there is danger of infection, and any person knowingly infecting another is fined \$250.

Provision is made that all proceedings under this act shall be secret, and any newspaper publishing an account of such proceedings shall be fined \$500 for the first offence, \$2500 for the second. The law, furthermore, forbids advertising of medicine, instruments, or appliances for venereal disease, impotence, female irregularities, etc. No printed matter in regard to such devices is allowed to be distributed in any way. Any breach of confidence by an administrator of the act may be punished by a fine of \$500.

To aid in educating the public in this matter, the government has issued a pamphlet dealing with sexual matters. This is written in a plain, non-technical style, the important passages are printed in red ink, and the common names of organs and diseases are used, besides their scientific ones, in order that there may be no misunderstandings. The ways in which these diseases may be contracted, the danger of infecting others, the horrible physical effects possible, and the precautions to be taken are all described clearly and for a full understanding of the importance of skillful treatment, and the fact that

## THE REGULATION OF VENEREAL DISEASE IN AUSTRALIA.

THE Western Hemisphere seems determined to be more progressive than the Eastern, even if a colony has to display its progressiveness at the expense of its mother country. Such is the



hint of the treatment is given—quite properly. Some of the most prevalent fallacies about sexual matters are mentioned and dispelled. This book must be handed by every physician to his venereal patients and it is also distributed in other ways, notably to the soldiers in camp.

This campaign against venereal diseases has the merit of enthusiasm, justice and vigor. The act in question is, perhaps, a little too rigorous in parts and in other parts leaves some loophole for evasion, but time will round off the rough edges. We hope that the Australian people will be ready for this legislation; otherwise, of course, it will soon become a dead-letter. The spirit in which it was conceived, however, is admirable, and coming generations will reap the benefit.

### A NEW FORM OF POST-GRADUATE TEACHING.

THE Springfield Academy of Medicine, under the presidency of Dr. H. W. Van Allen, has organized a new form of post-graduate teaching which bids fair to be most successful, and seems to possess many advantages. The academy announces the following courses, arranged with the coöperation of the Harvard Graduate School of Medicine, to be given in Springfield by teachers from the Harvard Medical School.

Eye, Ear, Nose and Throat. Philip Hammond, E. A. Crockett, Harris P. Mosher, Alexander Quackenboss. Tuesdays from Nov. 14 to Dec. 19.

Dietetics and Gastroenterology. Franklin W. White. Sundays from Nov. 17 to Dec. 22.

Clinical Laboratory Diagnosis. Lesley H. Spooner. Tuesdays from Jan. 2, to Feb. 6.

Obstetrics and Gynecology. Franklin S. Newell, William P. Graves. Fridays from Jan. 5, to Feb. 9.

Dental Infections and Arthritides. Geo. H. Wright, E. G. Brackett. Tuesdays from Feb. 13, to Mar. 20.

Cardio Vascular-Renal & Pulmonary Diseases. Frederiek T. Lord. Fridays from Feb. 19 to Mar. 23.

There are about six exercises in each course, beginning at 4:15 in the afternoon and lasting two hours. The number of physicians taking the different courses is to be limited by each instructor, and the courses are open to all members of the academy upon payment of a registration fee of five dollars. For each set of exer-

cises there is to be a monitor, selected from the local physicians, whose duty it is to see that all the material required by the instructor is made ready for him. Already in Springfield the success of the plan is assured and the courses are nearly all full. Provided the equipment and the variety of illustrative cases can be made comparable to those in the university centre, there can be no question of the advantages which such a course possesses for the busy physician practicing at a distance from the centre. For the instructor it means only the extra time of the train journeys, and limits this inconvenience to one person instead of inflicting it upon many.

It is obvious that certain courses can not well be given away from the technical laboratories of the medical schools or the wards of great hospitals, but the JOURNAL believes that this plan offers very great opportunity for much extension of knowledge and for an interchange of ideas, valuable alike to the university and to those whose practice is at a distance from the usual teaching centres. If the plan is continued, and is extended to other communities in New England, it may go far toward welding together medically this important northeastern corner of the country. It will bring the men doing work under the somewhat self-centering influence of large hospitals and special opportunities into contact with the broader problems of medical practice away from the university, and will increase their respect for their fellow workers. It will also prove to men outside that what may seem to them the self-satisfaction of the university men is often only a self absorption which needs the reagent of contact to make evident the presence of a real desire for coöperation.

### MEDICAL NOTES.

**POLIOMYELITIS EPIDEMICS.**—On Friday, October 13, the total number of cases of poliomyelitis in New York City reached the amount of 9187, with 2352 deaths. In Massachusetts the number of cases during the first fortnight of October reached a total of 331. The total number of cases in this Commonwealth since January first is 1347, of which 337, with 68 deaths, have been in Boston. There have been 23 cases, without fatality, at Worcester, Mass., and 85 cases in Providence, R. I.

**PREVALENCE OF DISEASE IN THE UNITED STATES.**—The weekly report of the United States Public Health Service for September 29 states that during the month of August, 1916,



there were in Mississippi, 33,579 cases of malaria, 658 of pellagra, and 1040 of typhoid fever. During the same period there were 419 cases of malaria in Louisiana and 940 cases of typhoid fever in Indiana.

**THE ORIGIN OF INTESTINAL ANASTOMOSIS.**—A correspondent in the issue of the *Lancet* for September 23, 1916, draws attention to the mediæval origin of intestinal anastomosis. He points out that Lanfranc, in his "Science of Chirurgie" (Capt. 7, Treatise 2), describes suture of the severed intestine over a pipe of elder. Lanfranc was the pupil of Salicrampi of Bologna, to whom, if not to Lanfranc, the origin of the idea may be due. This use of the elder pipe, dating back to 1250 A.D., may be regarded as the precursor of the Murphy button.

**HOSPITAL GIFT.**—It is announced that Mr. Herbert Kaufman, of Pittsburgh, Pa., has given, through Dr. H. B. Frauenthal, the sum of \$1,000,000 to the New York Hospital for Deformities and Joint Diseases, to be used for the erection of a new building and as an endowment fund.

#### EUROPEAN WAR NOTES.

**TUBERCULOSIS IN BELGIUM AND FRANCE.**—Dr. William Palmer Lucas, formerly instructor in pediatrics at the Harvard Medical School, later professor of pediatrics at the University of California, who had been engaged by the American Belgian Relief Commission to study health conditions in the conquered portion of that country, has recently made, under date of August 14, a report of his findings, which is, in part, as follows:

"It may be said at once that the increase in tuberculosis appears to me to be mainly a result of lowered vitality due to under-feeding, and that, if conditions were now to return to the normal, the unaffected adults would, upon liberal nourishment, within two or three months probably return to their former health conditions. This, of course, is not true of those who have become affected with tuberculosis, nor is it so true of the adolescent children, who are probably suffering more than any other group in this class.

"During the coming winter, with a diminution in the native supply of vegetables and fruit, which now, to a certain extent, these classes are able to procure, the ration will be considerably lower than it is at the present time, and unless something can be introduced, especially for the tuberculous, the whole tuberculosis situation will undoubtedly progress more rapidly than it has done in the past.

"Every tuberculosis sanatorium in Belgium is crowded, the waiting lists of all the sanatoria have increased, and the waiting cases are more acute than formerly.

"Not every aspect of the health conditions of the children in Belgium is so gloomy as these facts would indicate. Infant mortality has fallen since the beginning of the war and deserves special comment. It is generally evident that infant conditions are better than normal, this class having been the object of great solicitude since the beginning of the war.

"The solicitude of the whole relief organization over the question of health and nutrition has been insistent since its inception. The maintenance of these measures is an absolute and daily necessity to the population. The interruption for a single month of the work that is now being accomplished by the relief organization would unquestionably bring a physical debacle to the industrial and lower commercial classes."

In this conjunction may be noted the work already undertaken in behalf of tuberculous French soldiers, of whom it is reported by Mrs. Edith Wharton, that there are at least 100,000. In behalf of the French Tuberculous War Victims Committee, Mrs. Wharton has recently made the following report and appeal:

"It is urgently needful to provide further assistance without delay, and American initiative, by acting rapidly and efficiently, may not only render an immediate service, but set an example that will be followed in time by other organizations of the same kind.

"The work projected by the Tuberculous War Victims Committee is as follows:

"1. To establish as soon as possible at least three sanitary stations of about eighty beds each in different climates suited to different forms and stages of the disease.

"2. To open a hospital of about fifty beds in Paris, in which the patients may be kept under observation until it is decided to which station they should be sent.

"3. A separate station, for women and children, or a separate colony for women and children at each station, will form a complementary part of the work. At the present moment no free hospital for tuberculous civilians is open in France, and all existing hospitals for civilian patients are overcrowded and in a state of disrepair. Large numbers of the women and children from the invaded provinces are held ready to succumb to the shock and privations of travel, and are gone, and incipient cases of tuberculosis of alarming frequency in the provinces.

"4. The object of the committee will be not only to restore the curative value of the climate, but, so far as possible, to teach the children and adults, by enabling them to earn a few francs a day, or at least a few francs a week. With this view, a number of the children will be placed at its disposal, and the station will be surrounded by a few small plots of land, to be used as a kind of school garden, to which all sorts of vegetables will be sent.



"5. It is the intention of the committee to keep each patient as long as his or her condition requires.

"6. The Tuberculous War Victims Committee will be administered by Americans, but the superintendence and management of the sanitary stations will be principally in the hands of French doctors, superintendents and nurses especially qualified for the care of the tuberculous.

"The Boston committee, which is coöperating with Mrs. Wharton, contains the following-named persons:

"Miss Sally Fairchild (chairman), Dr. Vincent Y. Bowditch, Mrs. Arthur Cabot, Miss F. G. Curtis, Mrs. Allan Forbes, Mrs. Richard W. Hale, Dr. Edwin A. Locke, Mrs. George Cabot Lodge, Mrs. Robert W. Lovett, Miss Ellen Mason, Miss Fanny P. Mason, Mrs. Roger B. Merriam, Mrs. Edward Pickman, Professor W. T. Sedgwick and Dr. F. C. Shattuck.

"Richard W. Hale, 16 Central Street, Boston, is treasurer of the committee, and funds are earnestly solicited for the work. All subscriptions will be duly acknowledged in the public press."

**WAR RELIEF FUNDS.**—On Oct. 14 the totals of the principal New England relief funds for the European War reached the following amounts:

Belgian Fund .....	\$157,510.74
French Wounded Fund .....	126,240.71
Serbian Fund .....	102,886.07
Syrian Fund .....	67,646.61
Surgical Dressings Fund ....	48,425.45
Polish Fund .....	45,779.83
Italian Fund .....	25,968.54
St. George's Fund .....	14,731.92
French Tuberculous Fund ...	3,001.00
Louvain Professors' Fund ....	605.00

#### MEXICAN NOTES.

**MORBIDITY AND MORTALITY OF TROOPS.**—Report from Washington on October 4 states that during the week ended September 30, the morbidity percentage among militia troops on the Mexican border was 2.25, with seven deaths, as against 2.38 and six deaths for the preceding week. The corresponding figures for regular troops during the same period were 3.42, with five deaths, as compared with 2.53 and seven deaths for the previous week.

#### BOSTON AND NEW ENGLAND.

**WEEK'S DEATH RATE IN BOSTON.**—During the week ending Oct. 14, 1916, the number of deaths reported was 218, against 226 for the same period last year, with a rate of 14.95, against 15.21 last year. There were 34 deaths under one year of age, against 39 last year; and 65 deaths over 60 years of age, against 55 last year.

The number of cases of principal reportable diseases were: diphtheria, 33; scarlet fever, 18; measles, 8; whooping cough, 9; typhoid fever, 3; tuberculosis, 48.

Included in the above were the following cases of non-residents: diphtheria, 6; tuberculosis, 8; typhoid fever, 1; scarlet fever, 1; measles, 1.

Total deaths from these diseases were: diphtheria, 1; measles, 1; whooping cough, 1; tuberculosis, 20.

Included in the above were the following deaths of non-residents: tuberculosis, 4.

**BOSTON BABY HYGIENE ASSOCIATION.**—The Boston Baby Hygiene Association has recently issued statistics of its work for the past summer.

"During June, July, August and September, 3258 babies were cared for. These babies made 11,419 visits to medical conferences, an average conference attendance of forty, and received from the nurses 21,084 home visits. The registration showed an increase over the corresponding months last year of 8%. Conference attendance increased 24% and nurses' visits 26%, the increase in service being three times the increase in registration. As would be expected, although the number of babies cared for was greater than last year, fewer babies were referred to physicians and hospitals on account of illness. The Association at present has thirteen stations, seventeen medical conferences each week and seventeen full-time nurses."

Funds are urgently needed for the continuance of the work during the coming winter, and contributions for this purpose should be sent to the treasurer, F. Abbot Goodhue, Esq., 296 Boylston Street, Boston.

**OPENING OF NORWOOD HOSPITAL.**—The new Norwood (Mass.) Hospital was formally opened to the public for inspection on October 5. It will accommodate thirty patients and has a nursery and seven private rooms. The ground floor is devoted to the men's ward and to administrative offices; the second floor, to the women's ward, operating room and private rooms; and the third floor to the maternity department. The former building of the Hospital is to be moved and converted into a nurses' home.

**HOSPITAL BEQUESTS.**—The will of the late Mrs. Thomas Mack, recently filed in the Suffolk Court, contains a bequest of \$3000 to the New England Hospital for Women and Children.

The will of the late Ellen Williams contains a bequest of \$300 to the Holy Ghost Hospital.

The will of the late Henry F. Lynde, of Somerville, Mass., who died on September 24, contains bequests of \$3000 each to the American Red Cross, the Boston Dispensary, and the Massachusetts General Hospital.

The will of the late Margaret A. Simpson of Somerville, Mass., who died on September 9,



contains a bequest of \$15,000 to the Somerville Hospital, of which \$5000 is for a free bed and \$10,000 to constitute a trust fund, the income of which is to be used for the general purposes of the institution.

## Massachusetts Medical Society.

### STATED MEETING OF THE COUNCIL.

A STATED meeting of the Council was held in John Ware Hall, Boston Medical Library, Wednesday, October 4, 1916, at 12 o'clock, noon. The president, Dr. Samuel B. Woodward, was in the chair, and the following 93 councilors present:

BARNSTABLE,  
E. E. Hawes.  
C. W. Milliken.

BRISTOL NORTH,  
W. H. Allen.  
R. D. Dean.  
F. A. Hubbard.

BRISTOL SOUTH,  
E. F. Curry.  
W. A. Dolan.

ESSEX NORTH,  
L. J. Clarke.  
G. E. Kurth.  
E. H. Noyes.  
J. J. O'Sullivan.  
F. W. Snow.

ESSEX SOUTH,  
Emile Poirier.  
C. H. Bangs.  
R. E. Bicknell.  
N. P. Breed.  
J. F. Donaldson.  
P. P. Johnson.  
W. G. Phippen.

FRANKLIN,  
G. P. Twitchell.

HAMPDEN,  
E. P. Bagge, Jr.  
M. P. Birnie.  
T. S. Bacon.  
E. A. Knowlton.

HAMPSHIRE,  
J. S. Hitchcock.

MIDDLESEX EAST,  
C. J. Allen.  
G. N. P. Mead.

MIDDLESEX NORTH,  
J. V. Meigs.  
J. A. Gaze.

MIDDLESEX SOUTH,  
M. H. Bailey.  
H. T. Baldwin.  
C. H. Cook.  
G. W. Gay.  
A. A. Jackson.

G. A. Miles.  
C. E. Mongan.  
J. F. O'Brien.  
W. A. Putnam.  
Godfrey Ryder.  
E. H. Stevens.  
F. W. Taylor.  
J. O. Tilton.  
Julius Tolman.  
G. W. W. Whiting.  
Alfred Worcester.

#### NORFOLK.

T. F. Greene.  
E. B. Brigham.  
A. N. Broughton.  
P. W. Carr.  
C. B. Faunce.  
R. W. Hastings.  
G. W. Kaan.  
Bradford Kent.  
Joseph Kittredge.  
W. A. Lane.  
T. J. Murphy.  
A. P. Perry.  
J. W. Pratt.  
Victor Safford.

#### NORFOLK SOUTH.

C. S. Adams.  
J. C. Fraser.  
E. N. Mayberry.

#### PLYMOUTH.

A. A. McKeen.  
Gilman Osgood.  
F. G. Wheatley.

#### SUFFOLK.

E. S. Boland.  
E. M. Buckingham.  
W. L. Burrage.  
David Cheever.  
J. A. Cozart.  
G. A. Craigin.  
E. G. Cutler.  
R. L. DeNormandie.  
Albert Ehrenfried.  
J. B. Hawes, 2d.  
H. T. Hutchins.  
J. L. Morse.  
Abner Post.  
Anna G. Richardson.

G. B. Shattuck.  
H. F. Vickery.  
Dr. H. Walker.  
C. F. Withington.  
David Harrower.  
A. G. Hurd.  
F. H. Washburn.  
S. B. Woodward.  
C. D. Wheeler.

#### WORCESTER.

G. O. Ward.  
F. H. Baker.  
Homer Gage.  
WORCESTER NORTH,  
E. L. Fiske.  
A. P. Mason.

It was voted to dispense with the reading of the records of the last meeting.

The president said he appreciated the honor of election to the presidency, and bespoke the cooperation of the councilors in the furtherance especially of desirable legislation affecting the medical profession; that physicians were too apt to underestimate the influence that a united profession could exert at the State House—a power that is recognized by the layman. He thought that the proposed consolidation of the Boards of Registration last year was defeated partly because of letters of protest that were sent to every senator and representative by a district medical society. The Committee on State and National Legislation has done notable work at the State House for many years. It has an auxiliary committee composed of one or more members from each senatorial district. It seems to be desirable that the members of this auxiliary committee should keep in touch with the family physicians of the legislators in order that they may be informed through the central committee of the facts regarding proposed legislation from a medical point of view. Prompt cooperation by the district secretaries with the Committee on State and National Legislation was requested by the president as chairman, under the by-laws, of this committee.

The committee, consisting of the president, secretary, treasurer and the chairman of the standing committees on membership and finance and public health, elected at the annual meeting, June 8, 1915, had conferred with Henry Copple Greene, Carl Carstens and Miss Mary Beard, as authorized, and last June decided to engage Mr. E. A. Ingham, of the department of biology of the Massachusetts Institute of Technology and a graduate of the school of public health at Harvard Medical School as an agent of the committee, and is now at work under the direction of the Committee on Public Health. The funds subscribed to the public health individuals, amounting to some \$100,000, are now in the hands of the treasurer, and will be expended by the agent through the action of the above committee. The committee has the following objects:

1. To stimulate the interest of the medical profession in Massachusetts in the study of hygiene and preventive medicine.
2. To urge on the State the importance of public health officers.
3. To stimulate better methods of inspection of schools, infants, and children.



work, district nursing, anti-tuberculosis work, industrial hygiene, sanitary engineering, and the prevention of the common communicable diseases.

4. To investigate the health conditions of the State, with reference to the public health work.

During the summer the president had enjoyed the hospitality of five of the District Societies at their regular meetings, and had taken pleasure and profit in this close association. He hoped that the councilors were ready for co-operative work for the good of the Society, "one for all and all for one."

The president nominated and the Council appointed these delegates to the annual meeting of the Vermont State Medical Society, at St. Johnsbury, October 12-13, 1916: F. C. Downing, Lanesborough; N. P. Wood, Northfield.

In the same manner were appointed this committee to audit the treasurer's accounts: E. O. Otis, Boston; J. B. Ayer, Boston.

The following report of the Committee on Membership and Finance on membership and the report on finance were presented by Dr. Alfred Worcester, in the absence of the chairman. Both reports were accepted and their recommendations adopted by unanimous votes:

#### REPORT ON MEMBERSHIP.

THE COMMITTEE ON MEMBERSHIP AND FINANCE makes the following recommendations as to membership:

1. That the following named Fellows be allowed to retire, under the provisions of Chapter I, Section 3, of the by-laws:

John Gilbert, of Fall River.  
William Henry Grainger, of East Boston.  
William LeRoy Paddock, of Pittsfield.  
Frank Edward Porter, of Auburndale.

2. That the following named Fellows be allowed to resign, under the provisions of Chapter I, Section 7, of the by-laws:

Clarence Pennell Baxter, of Topsfield.  
Charles Frederick Morse, U. S. A. ("Somewhere in Mexico").

3. That the following named Fellows be deprived of the privileges of fellowship for non-payment of dues, under the provisions of Chapter I, Section 8, of the by-laws:

Anna Judkins Andrews, of Boston.  
Osmyn Baker, of unknown address.  
Willmar Howard Bliss, of Strewsbury.  
William Frederick Boos, of Brookline.  
Nathaniel Perkins Breed, of Douglaston, Long Island, New York.  
Chester Perkins Brown, of Cambridge.  
Christopher James Carr, of Saxonville.  
George Alanson Crittenden, of Huntington.  
Richard Andrew Elliott, of Avon.  
Jay Percy Graham, of Springfield.  
Harry John Hagerty, of Worcester.  
William Frank Hayward, of East Brookfield.  
Clyde Clifford Johnston, of Springfield.  
Patrick Joseph Kingsley, of Dorchester.  
Antoinette Frederic Konikow-Bucholz, of Malden.  
Myron Lawrence Marr, of Dorchester.  
James Zuslofsky Naurison, of Springfield.  
Walter Erie Lothar Nietsch, of New Bedford.  
William Nelson Noyes, of Salem.  
John Wilson Parks, of East Boston.  
Laurence Earl Poole, of Gardner.

John Thomas Haliburton Powers, of Chicopee Falls.  
Julia Seton Sears, of unknown address.  
Thomas Ahern Shaughnessy, of Leominster.  
Eleanor Mary Slater, of Denton, Texas.  
Caroline Louise Thomas, of Malden.  
Thomas Henry Tracy, of unknown address.  
Frederick Myles Turnbull, of Allston.  
John William Voss, of Beverly.  
Harold Lowe Wallace, of Allston.  
Edward Silvanus Ward, of North Attleborough.  
Alva Harding Warren, of Everett.

4. That the following named Fellows be allowed to change their district membership, without change of legal residence, under the provisions of Chapter III, Section 3, of the by-laws:

Donald Vinton Baker, from Middlesex South to Suffolk.  
Eugene Gorham Hoitt, from Norfolk to Middlesex South.

For the Committee on Membership and Finance,  
CHARLES M. GREEN, *Chairman*.  
REPORT ON FINANCE.

THE COMMITTEE ON MEMBERSHIP AND FINANCE makes the following recommendation as to Finance:

That the affiliation with the BOSTON MEDICAL AND SURGICAL JOURNAL be continued, at an expense to the Society of three dollars (\$3.00), for each member in good standing.

For the Committee on Membership and Finance,  
CHARLES M. GREEN, *Chairman*.

The secretary read the reports of committees appointed at the last meeting to consider the petitions for reinstatement of J. D. Taylor, E. J. McCarthy and C. A. Oak, and the Council acted favorably on all of them. The petition of P. S. Marie was referred, by vote, to this committee: F. A. Hubbard, W. Y. Fox, A. F. Milot.

An invitation from the National Association for the Study and Prevention of Tuberculosis to send delegates to the third New England Tuberculosis Conference at New Haven, Conn., was read. It was moved and seconded that delegates be sent, and being put to a vote, was so voted, and these delegates were appointed on nomination by the president: A. K. Stone, Boston; A. C. Getchell, Worcester; G. F. Hart, Webster.

The president nominated and the Council appointed Homer Gage, Worcester, chairman, and J. B. Howland, Boston, secretary of the Section of Hospital Administration that was established by vote of the Council last June.

Dr. E. E. Hawes read a petition from the Barnstable District Medical Society asking that the annual dinner and reunion of the Society be held at 1 p.m., as in former years. He explained that the Fellows in his district, in order to attend the annual dinner, were forced to spend two nights in Boston; that they especially missed the social features of the meeting; that if Barnstable was the only district thus affected it would withdraw its petition; that it was his opinion that the dinner had not been so well attended since the change had been made, and he would like to have the matter discussed. Dr. Broughton, who was chairman of the Committee of Arrangements when the change was made in 1912, pointed out that the first evening dinner was attended by 940, as against a previous at-



tendance at midday dinners of about 1200. At the next dinner there were 1198 diners. When the plan of having every Fellow who attended the dinner pay \$1 was introduced in 1914, the attendance fell to about 700 and had remained there since. (1914, 700; 1915, 763; 1916, 704.) He thought that the previous one o'clock dinners had been undignified, and that many of the diners left immediately after the dinner, without waiting to hear the speakers, and that the character of the banquets had been improved by the change.

Dr. Withington regretted that the Fellows in the Barnstable and Berkshire districts were so far away that it was difficult for them to attend without spending another night, but he thought that there were so many living within forty miles who were able to attend an evening dinner, that that was the better time for a banquet. He suggested that the dinner might be given on the first day of the annual meeting, Tuesday, in the evening, rather than on Wednesday evening, and that the Committee of Arrangements might be able to arrange for it at that time. He made a motion that the time of the annual dinner be referred to the Committee of Arrangements, with a request to report to the Council at its February meeting, and it was so voted.

Dr. J. B. Blake made the following report for the delegation to the House of Delegates of the American Medical Association, last June:

**REPORT OF DELEGATES FROM THE MASSACHUSETTS MEDICAL SOCIETY TO THE HOUSE OF DELEGATES, AMERICAN MEDICAL ASSOCIATION.**

Massachusetts was represented by a complete delegation at the June meeting of the American Medical Association in Detroit.—J. B. Blake, P. B. Lund, G. Osgood, H. G. Stetson, L. F. Woodward.

An unusually large amount of work was accomplished by the House of Delegates with an exceptional unanimity of action; important changes were made in methods of procedure, and extremely interesting reports received, considered and adopted. A summary of the proceedings appeared in an editorial in the *American Medical Association Journal* of June 24th—which gives a good idea of the results.

"The Detroit session promises to be the most epoch-making of any since 1901 for two reasons: First, and more important, was the creation of the office of Chairman of the House of Delegates. This will relieve the President of the Association of the task of presiding over the House of Delegates. The President is usually elected on account of his scientific attainments, and not because of his ability to preside over a deliberative body. This new order of things will be a great relief to the President, and will give him time to attend to and participate in the functions which naturally appeal to the presiding officer of a great scientific body such as the Scientific Assembly has become. On the other hand, the House of Delegates will be presided over by a man selected because of his knowledge of the activities of the Association, of the procedure of the House of Delegates, and on account of his ability as a presiding officer. The House selected as its first Chairman, Dr. Hubert Work of Pueblo, who for many years was a member of the House and who is thoroughly conversant with its procedures. The second epoch-making change is that which provides that the opening meeting of the

Scientific Assembly—the General Meeting—shall be held on Tuesday evening, the scientific sections to convene on Wednesday morning instead of on Tuesday afternoon as heretofore. The main object of this change is to give the House of Delegates two days for its deliberations before the opening of the Scientific Assembly. It is unnecessary to dilate on the importance of this change so far as the House of Delegates is concerned; many men have hesitated to serve as members of the House because that work has prevented them from attending the sections. Under the new order of things the great probability is that the House of Delegates will complete its work on Tuesday, except for the election of officers, and business incidental to its closing meeting. The change will also be of decided advantage to the Scientific Assembly. Heretofore the Scientific Assembly commenced Tuesday morning, the first half day being taken up with the opening general meeting. Hereafter the opening exercises will take place on Tuesday evening, and the scientific sections will begin their programs on Wednesday, continuing through Thursday and Friday, meeting both morning and afternoon."

Among the other matters that came before the House was the consideration of the National Board of Medical Examiners. Dr. Rodman, the former President of the American Medical Association, was very active in originating and working for the establishment of this Board. There are great possibilities which may be expected from the activities of this Board in the matter of standardizing the licensing of physicians in the different states throughout the country, and it is, therefore, of vital general interest. The Board has sought the endorsement of the great national societies; after a very careful and rigorous investigation the House of Delegates gave its cordial endorsement to the National Board of Medical Examiners. A Massachusetts physician is a member of this Board.

The Massachusetts delegates were faithful in attendance and willing in the work of the meetings. The entire New England delegation agreed to nominate, for the Board of Trustees, Dr. Everett Jones McKnight, of Hartford, Connecticut, to take the place of Dr. Lutz, of St. Louis, who had died, and Dr. McKnight was elected. Massachusetts physicians prominently represented in all the important committees and committees of the American Medical Association.

Dr. L. M. Paley made an oral report of his attendance as a delegate at the 150th anniversary of the New Jersey Medical Society, June 20, 1916, at Ashbury Park, New Jersey. The most cordially received and interesting of the kindly messages were sent by the Massachusetts Medical Society. He thought well of the custom of that society, namely, to write the wives, mothers and sisters of the members to their anniversary and to the Massachusetts Medical Society.

The privileges of the new hospital of the R. B. Greenough Hospital, Boston, were commending Senator Worcester, of the Olney for their services in the history of the Army Reserve, and the amendment which would give the history of the Army Reserve, and the Guard are still a part of the medical officer, and the proper to be of the Army and the proper to be of the Army. After discussion by Dr. Deane, Dr. W.



and Dr. Stevens, the resolution was laid on the table.

Dr. F. J. Cotton presented the following report for the Committee on Industrial Health Insurance:

Your committee was entrusted with the care of medical interests in the face of impending legislation to provide workmen's sickness insurance as a compulsory state insurance measure. We say "impending," for though it seems rather unlikely that such a measure will be passed at the next session of the Legislature, yet it seems to be coming pretty certainly before very long. It seems to be so imminent that we should be ready for it. What we did first was to talk over the general medical question, and then to take up the work done by the committee of the American Medical Association presented last spring. This report, published in the *JOURNAL* of the Association June 17, 1916, is probably well known to many of you. After very careful consideration in detail, your committee found only minor points in which we differed or wished to add to this report. Our comments and changes are appended. For consideration of the broad problem we have held to the so-called Doten bill as the type of legislation likely to be considered, and as it will come up automatically this year in the Legislature. This bill provides for no share to be taken by the insurance companies, and puts control in the hands of local mutual companies under state control. This plan lends itself to proper medical organization. It is important that medical affairs should be so arranged that choice of physician, at least within the limits of a very wide panel, be conserved. Central supervision and authoritative inspection are, of course, essential. All these things are considered in the reports above mentioned and need not be gone into here. We have talked over the situation with certain members of the recess committee of the Legislature, and we appeared, all three of us, together with Dr. A. N. Broughton and Dr. J. J. Hurley, at the only public hearing given by that committee and took part in the discussion. We have been informed by Mr. Farnsworth, the chairman, and by Mr. Catheron, another member of the committee, that they will let us know when the time comes (if it does come) for drafting any projected measure, or if there is any other way in which we can be of use. The representative of the State Department of Health on the recess committee, appointed by the Governor, is Dr. W. W. Walcott, of Natick, and we herewith acknowledge and thank him for his very intelligent cooperation with your committee. His presence on the recess committee is very fortunate, and with him there we can keep more closely in touch. We submit this as a report of progress.

F. J. COTTON,  
F. W. ANTHONY,  
W. H. MERRILL.

Dr. G. W. Gay showed to the Council the first book of the records of this Society, beginning with November 1, 1781, and stated that this book and three others, one of the Society records and two of the Council records, the four covering a period of forty-five years, and the small "Charter Book" were being typewritten through the generosity of the president. The official printed records of the Society and of the Council began in the year 1826. Previous to that date, the old books kept in the Society's safe in the vault were the only record of the early history of the Society, and should they be destroyed there would be nothing to show what had taken place in those early days. He hoped that when the typewriting had been completed some friend would come forward with the means for having them printed in a fashion similar to the existing records.

Dr. Gay read the following report on malpractice defense:

#### ANNUAL REPORT ON MALPRACTICE DEFENSE.

The number of cases of threatened suit for alleged malpractice presented to the secretary during the year ending October 1, 1916, was 28. Of this number, 12 were placed in the hands of counsel, 6 applications are in the files, thereby putting them in shape for further action, if necessary, and in 10 cases blanks have been sent and questions have been answered.

Of the 6 active cases referred to in the last report of our legal counsel, as of June 1, 1915, three are disposed of and three are alive, but not active. It may be doubted if they are ever revived.

Thirteen cases have come up this year, of which five have been disposed of. All verdicts thus far have been in favor of the defendant. On finding that the Society defends the suits of its members, many cases have been dropped and others are moribund with little prospect of a revival. The fact that the Society pays no damages, no verdicts, and will pay nothing towards settlement, discourages the shysters and lessens litigation. This is the result of experience in most, if not all the state societies. No hush money is paid to keep a case out of court. It is fight or retire.

The Medical Society of the State of New York has had a medical defense act in force for seventeen years. In over 200 suits no final verdict has, as yet, been returned for the plaintiff. No physician has been called upon to pay damages in any case defended by that Society's attorney. While our cases seem to be increasing, they seem to be decreasing in New York. In 1913 they had 57 cases, in 1914, 55 cases and in 1915, 44 cases. In that state, and doubtless to some extent here, suits are threatened to avoid the payment of the doctor's bill.

The alleged grounds for complaint in our cases are varied and interesting. As might be expected, fractures head the list. Of 19 cases at present, or recently in the hands of our counsel, seven, or more than one third, are of that sort. Four cases had to do with confinements. One suit is pending in which the physician is accused of negligence in permitting exposure to a contagious disease. The diagnosis of syphilis was the ground of another suit, but as the diagnosis was made by our leading experts, there was no difficulty in obtaining a verdict for the defendant.

*Expenses.* The amount paid out by this Society for the defense of its members from January 24 to July 5, 1916 is \$699.02, or an average of about 19 cents



apiece, as against 11 to 12 cents previous to this year. There are various reasons for this large increase, among which mention may be made of the following: The existence of the act is becoming more generally known among our Fellows and they are recognizing the wisdom of availing themselves of its advantages. It has been suggested that perhaps the increase in the number of suits brought, or threatened, is due to the Workmen's Compensation Act. This act has diminished litigation to a certain extent and, as a consequence, some members of the legal profession have encouraged suits against the medical profession more eagerly than formerly.

There can be no doubt that the trend of the times encourages all sorts of tricks to extort money from any defendant, who may chance to have more than the plaintiff. The rich are considered legitimate prey by a large class of people. Get something for nothing. What easier way is there than to threaten litigation with the hope of a settlement, the payment of hush money, or the evasion of a bill?

The object of this medical defense activity is to discourage fake suits and to protect our members from the expense and the annoyance of that sort of imposition. That it is a sane and sensible object would seem to be proven by the fact that about twenty-five state medical societies have adopted the practice and thus far none have repealed the act. This Society has entered upon its ninth year of defending its members in litigation, active or threatened, and time and experience serve only to demonstrate its value.

Dr. A. N. Broughton reported extemporaneously for the Committee on the Workmen's Compensation Act, saying that, on account of pressing professional calls, he had been able to devote little time to the duties of the office of chairman of the committee, an office he had not sought. He suggested that the committee be enlarged, and said that he was not anxious to remain as chairman, suggesting further that the city editors of the newspapers should be approached so that the profession might have a proper representation, and that a trained legislative aid be secured in order to coordinate the needs of the medical profession and to follow this sort of legislation. The need of immediate action by the Council was emphasized by Dr. Cotton and Dr. Dolan, the latter moving that the Central Committee appointed by the "First Legislative Convention of Massachusetts Physicians," held at Worcester, September 20, 1916, be added to the Committee on the Workmen's Compensation Act. (For Central Committee see BOSTON MEDICAL AND SURGICAL JOURNAL, October 5, 1916, p. 513.) The motion was amended to read that those members of the Central Committee who are Fellows of the Massachusetts Medical Society be added to the committee, and that the remaining two members be invited to join with the committee. As amended, the motion was put and passed. The question of providing funds for this committee was discussed by these councillors: Worcester, Clarke, Ward, Kaan, Dolan, Buckingham, Twitchell. Finally, after several plans had been discussed, the following vote was passed:

*Voted*, That the committees on the Workmen's Compensation Act and on Industrial Health Insurance be allowed to expend such sums as they deem necessary, subject to the

approval of the president and the Committee on Membership and Finance.

Dr. G. P. Twitchell presented and explained to the Council proposed amendments to Chapter V of the by-laws, appearing as a committee voted by the Board of Supervisors at a special meeting, held earlier in the day. The proposed amendments suggested by the Supervisors follow:

Page 17, Section 1 (*Board of Supervisors*, line 7, to follow the word "board," this sentence: He shall call special meetings at the request of five supervisors.

Same page, same section, third paragraph (*Diplomas of colleges not on list*, add at end of paragraph, deleting the period, the following: by the district secretary before an applicant is permitted to take an examination.

Same page, same section, last paragraph (*Examinations when held*, second line, delete "at 2.00 p.m."; also next line, change the word "second" to "first" in the two places where it occurs.

Page 18, Section 2 (*How applications are made*), first line, substitute the word "fellowship" for the word "examination."

Same line, after the word "apply," insert the following: on blanks furnished for the purpose, . . .

Same section, end of second line, delete the semicolon and add the following: at least one week before the date of a given examination.

Same page, Section 3 (*Duties of district secretaries*, second line, to follow the word "censors," add the following: shall furnish applicants with blanks adopted by the board of supervisors; they, . . .

Adjourned at 2.19 p.m.

WALTER L. BURGESS,  
Secretary

#### APPENDIX TO REPORT ON HEALTH INSURANCE

CHANGES IN, AND COMMENTS ON THE REPORT OF THE AMERICAN MEDICAL ASSOCIATION COMMITTEE TO THE JUDICIAL COUNCIL OF THE ASSOCIATION OF MAY 15, 1916, BY THE COMMITTEE OF THE MASSACHUSETTS MEDICAL SOCIETY

Section 10, p. 323 of the bulletin

All of your committee favor the proposed plan, but feel that, in the body of the report, it should include all applicants who are engaged in the practice.

Later wording of the bulletin is: "The plan is being tried out by the committee on the health insurance, and the committee on the health insurance is working out the details of the plan." This is a misstatement of the facts.

Section 11, p. 324 of the bulletin  
We feel that the committee on the health insurance should be given the right to select the members of the committee on the health insurance, and that the committee on the health insurance should be given the right to select the members of the committee on the health insurance.

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Obviously, this scheme will necessitate strong central censorship to avoid padding of bills by unnecessary visits on the part of our few medical undesirables. We feel, however, that this item can be handled:—the lowering of standard inevitable to the "capitation" plan—the plan that has led to the slipshod "lodge" practice we all know,—we feel that this result of a mistaken system cannot be controlled or remedied, and that such a scheme is likely to nullify much of the benefit of the contemplated plan, both as regards patient and physician.

We think there must be a corps of medical referees to adjudicate disputes between injured and carrier as to ability of patient to return to work.

These referees should be appointed by the state central body, not by the locals (as is now done in accident cases).

Provision must be made for payment of these referees,—per case.

The reports of these referees must stand as evidence at hearings.

(If referees are compelled to go to hearings we shall not get the right sort of men to serve as referees at any rate we can afford. This difficulty has already shown itself in cases coming before the Accident Board.)

The question comes up to dentists and dental surgeons—very necessary citizens. They must be taken account of.

Provision must be made to ensure that the referee shall not be the same man as the consultant of the practitioner in charge of the case.

Page 352 of the reprint, lines 8 seq.

We feel that the recommendations here given, sound enough as to big metropolitan hospitals, cannot be made to apply to many hospitals in small or even larger communities, hospitals in which there is no service head, hospitals still run under the old rotating service plan.

Many of these give excellent service, and must be considered.

It is obvious that some provision must be made for employment and compensation of the masseur, the hydrotherapist, etc.,—people we think too little of, considering how indispensable they are.

Pharmacists who turn in bills should in turn be subject to reasonable control.

It is evident that there must be medical inspectors,—local officers,—young medics presumably, who shall have general charge of the local situation, shall refer cases to the central bodies, if they think patients should go to base hospitals, should try light work, should be discharged:—shall report all irregularities. Only with such "scouts" can this scheme be protected from its natural enemies.

Given the right kind of men, their salaries need not be large,—and they would save money.

Change of physicians at the request of either patient or doctor, must be allowed, subject to the rise of the medical inspector.

The question comes up of limitation of work to be done by any one doctor. Obviously, there is a limit beyond which really adequate care is not possible.

We feel, however, that such control should be vested in the central committee.

It is apparently impossible to formulate exact rules as to this.

In a properly equipped company hospital,—as for example the American Steel Wire of Worcester, or even the smaller Gray and Davis plant in Cambridge, one man can do far more work—and do it well,—than is possible to the best ordinary general practitioner with his more meagre equipment. One point, not unimportant, is that the necessary expenses of the central medical committee, the charges for hearings, etc., the expenses for and by medical referees, should not be charged as medical expenses.

They are really part of the administrative overhead, and have nothing to do with medical care of the sick or hurt.

If we bear this in mind, we shall avoid a source

of confusion that has given trouble under our Accident Law.

We feel that there should be a committee of panel physicians in a given locale, to hear disputes, to recommend action to the central committee, but without power to decide.

Such a committee would recommend action to the central commission, to the local board of directors, etc.

We feel that a permanent appointed complaint-committee is preferable for various reasons to a "pick-up" committee.

#### APPOINTMENTS.

DR. CHEVALIER JACKSON of Pittsburgh, Pa., has been appointed professor of bronchoscopy, esophagoscopy and direct laryngoscopy at the New York Post Graduate Medical School and Hospital.

DR. CHARLES W. PILGRIM, superintendent of the Hudson River Hospital, Poughkeepsie, N. Y., has been appointed president of the New York State Lunacy Board.

#### RECENT DEATHS.

DR. FRANKLIN HAVEN CLARK, who died recently at Denver, Colo., was born in Boston on March 17, 1862, the son of a physician. He received the degree of A.B. from Harvard in 1884, and that of M.D. in 1887. Owing to the failure of his health, he never engaged in practice, but after studying for a time in Germany, devoted the remainder of his life to travel, especially in Japan, Italy, and in the Orient. He is survived by his widow, one daughter, and three sons.

DR. JOHN M. EAGER, who died recently at Naples, Italy, was born in New York State in 1854. He received the degree of M.D. from the New York College of Physicians and Surgeons in 1887, and for the next five years practised his profession in Philadelphia. On July 1, 1892, he was appointed assistant surgeon in the United States Public Health Service. He was commissioned surgeon on February 9, 1909, and on August 4, 1912, was assigned to the sanitary office of the American Consulate in Naples.

DR. RUDOLPH VON ELDORF, a surgeon of the United States Public Health Service, who died recently at Lincolnton, N.C., was born in Pennsylvania in 1873. He was well known for his investigations on malaria, typhoid and yellow fever. He had served at various quarantine stations in Savannah, Havana, and elsewhere, and at the time of his death was in charge of the United States Marine Hospital at New Orleans. He is survived by his widow and by one daughter.

#### NOTICES.

SUFFOLK DISTRICT MEDICAL SOCIETY. CENSORS' EXAMINATION.—The censors of the Suffolk District Medical Society will meet to examine candidates for admission to the Massachusetts Medical Society at the Boston Medical Library, 8 The Fenway, on Thursday, November 9, at 4 P.M.

Candidates, who must be residents of the Suffolk District or non-residents of Massachusetts, should make a personal application, at least three days before the examination, to the Secretary, at 355 Marlborough street, between 4 and 5 o'clock, P.M. (except Saturdays and Sundays), and present their medical diplomas.

DAVID CLEVELAND, Secretary.  
Suffolk District Medical Society.



# The Boston Medical and Surgical Journal

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## Address.

### ANTERIOR POLIOMYELITIS.\*

By A. J. McLAUGHLIN, M.D., BOSTON.

Surgeon, U. S. Public Health Service; Commissioner of Health of Massachusetts.

#### CAUSE OF THE DISEASE.

ALTHOUGH much remains to be learned in regard to poliomyelitis, certain facts have been demonstrated beyond question. The disease is caused by the presence in the central nervous system of a minute microorganism which belongs to the group capable of passing through a Berkefeld filter. The organism or virus is cultivable *in vitro* on suitable media. The virus from human cases is pathogenic for apes, producing characteristic symptoms similar to those observed in human cases. The rabbit is susceptible though he is apt to prove refractory, and if symptoms are produced, they differ markedly from those observed in man. The guinea pig has been reported to be susceptible at times. No other animals are known to be susceptible.

#### SOURCE OF THE VIRUS.

The only known source of the virus is the human body, although the possibility of another reservoir in some animal must be considered. In persons dead of poliomyelitis the virus has been

found in the brain, spinal cord, mesenteric glands, tonsils, and secretions of the nasopharynx and intestines. In acute cases the virus has been found in the secretions of the nasopharynx and washings from the rectum. It has also been found present in the secretions of the nasopharynx and intestines in convalescents after several weeks or even months, and in the nasopharyngeal secretions of apparently healthy persons who had been exposed to infection. The virus has been recovered from dust in rooms occupied by patients with poliomyelitis.

The demonstrated sources of infection are therefore:

- Persons ill with poliomyelitis.
- Convalescents.
- Healthy carriers.

#### TRANSMISSION.

The question of the mode of transmission of the virus from its reservoir to the susceptible individual is still in doubt, but it is probable that it may be transmitted by direct contact with the secretions of the infected individual. It has been found that the virus may survive for several weeks in a solution of saline.

The virus has been found in the secretions of the nasopharynx and intestines of convalescents after several weeks or even months, and in the nasopharyngeal secretions of apparently healthy persons who had been exposed to infection.

\* Delivered at a joint meeting of the Boston Medical and Surgical Association and the Massachusetts Homœopathic Society, held at the Hotel Marlborough, Boston, October 19, 1916.



iologic observations, while appearing to support in some particulars, in other phases tend to make such a conclusion impossible.

Very often laboratory experiments do not represent natural conditions, but some of the possible modes of infection of monkeys, demonstrated by laboratory experiment, approach natural conditions and suggest the most feasible and probable portal of infection. Monkeys may be infected by rubbing the virus upon the nasal mucous membrane, and this suggests a possibility of easy infection through the nasopharynx under natural conditions.

Frost\*, in his scholarly monograph, makes the following sane and logical deduction:

"On the whole the experimental evidence, taken alone, while not excluding other means of transmission, points to the conclusion that poliomyelitis is a contagious disease, spread from person to person through interchange of infectious secretions, the sources of infection being the clinically definite and clinically indefinite acute cases of poliomyelitis, convalescents, and passive human carriers."

#### EPIDEMIOLOGY.

A brief review of its epidemiologic peculiarities will illustrate the contradictory and variable nature of its manifestations in the field.

#### GEOGRAPHIC DISTRIBUTION.

Poliomyelitis is of world-wide distribution. Its outbreaks have occurred in every climate from the equator to the North Temperate Zone. It is true, however, that it has been reported more constantly and in greater evidence in the northern than in the southern states of the Union.

#### SEASONAL PREVALENCE.

The seasonal prevalence of poliomyelitis is more characteristic than any of its other epidemiologic manifestations, with the exception of its age incidence. It reaches its maximum in August and September, although cases are reported in every month of the year in Massachusetts. Its seasonal prevalence resembles that of diarrhea and enteritis of children, and typhoid fever. The presence of the virus in the intestinal contents strengthens the analogy. Its seasonal prevalence also corresponds to the period of greatest activity of mosquitoes and flies, and, therefore, is consistent with the theory that biting insects are a factor in its causation. Some observations have seemed to show a relation between dust and dry seasons and the outbreaks of poliomyelitis. On the other hand, it has been prevalent in wet seasons and in wet climates.

It must be remembered that this disease is not confined to summer or early autumn. We not

only have it every month in the year, but its endemic prevalence is probably much greater than reports show. Race, nationality and sex show no marked or characteristic influence. Social and economic factors seem to play a small part in its transmission. Cases are reported from the homes of the rich, the well-to-do, and the poor. The sanitary conditions surrounding the home do not seem to be a determining factor.

#### PECULIAR MANNER OF SPREAD.

Most diseases spread in a regular progression along the lines of travel. This applies even to those diseases which are transmitted by insects. This is not always so with poliomyelitis. It may be epidemic in Washington, evade Baltimore, and attack Philadelphia; or, as Frost pointed out, the epidemics of 1908, 1909, and 1910, in Minnesota, Iowa and Nebraska, were commonly regarded as sequelae of the New York epidemic. Chicago, however, through which practically all travel to these states from New York passed, escaped.

On the other hand, there are instances of rapid spread over a wide area, apparently on radial lines from a central focus, as the Iowa epidemic of 1910, and the Swedish outbreak in 1905, described by Wickman. We have instances of rapid radial spread which suggest man as the carrier, but there are also the instances difficult to explain, of exemption of cities most exposed to infection through travel, as Baltimore, in 1910.

This same peculiarity of sparing an intervening city between two badly infected cities is noted in the spread of cerebrospinal meningitis. The peculiar distribution of poliomyelitis and small total incidence in the population find an analogy in some plague epidemics, but its age incidence is totally at variance with that of plague.

#### SMALL NUMBER OF PERSONS ATTACKED.

Less than 1/10 of 1% often represents the attack rate in an outbreak, or less than one person per thousand of the population. This peculiarity has not been explained, although two logical explanations have been suggested,—either that the amount of susceptible material is limited by some immunizing influence, or that its transmission is devious and selective, involving possibly an animal reservoir and an insect transmitter.

#### URBAN AND RURAL PREVALENCE.

The prevalence of the disease seems to be greater in rural and suburban districts than in cities. It must be conceded that most of these observations have been made in epidemics rather than in times of endemic or low prevalence.

\* Frost, Wade H.: Poliomyelitis. Reprint No. 350, Public Health Reports, Washington, 1916.



## AGE INCIDENCE.

The most consistent epidemiologic characteristic of poliomyelitis is the age incidence. In a mass of contradictory and irregular manifestations only the seasonal prevalence and age incidence are consistent. The great majority of the cases are children under five, a smaller group from five to ten, a few from ten to twenty, and only rarely over twenty.

Assuming that poliomyelitis is a communicable disease, transmitted from person to person, if the rural prevalence is higher in epidemics than the urban, it follows that there must be relatively more susceptible material in the rural districts. It is reasonable to suppose that some immunizing influence, operating more constantly and more actively in the city, cuts down the amount of susceptible material. What is the nature of this influence? Is it due to an increased resistance coming on with age, or is it due to an active immunity acquired by having had the disease in a light or abortive form? It has been demonstrated that convalescents and healthy carriers harbor the virus in the nasopharyngeal secretions for weeks and months. It has also been shown that in apes the nasopharynx, with its close relation, through the lymphatics, with the central nervous system, is an easy portal of entry, and monkeys inoculated intracerebrally have shown that the nasopharynx is also a point of egress for the germs. We have here all the conditions for the widespread distribution of the virus.

In all recent epidemics light and abortive cases have been shown to be numerous. It is not unlikely that these light cases, which ordinarily pass unrecognized, without paralysis, or paralysis of the most fleeting character, constitute a larger part of the total morbidity than the frank paralyzed cases. In considering the possibility of an active immunizing influence, we must concede also the possibility of variations in virulence, not alone as among individuals attacked, but variations in virulence of the outbreaks themselves. Variations in virulence exist in practically all microorganisms, and the virus of poliomyelitis is no exception. The difference noted in individual cases in the severity of the attack may be due to a complex set of conditions, involving not only the infecting agent, but also the susceptibility or self-protective power of the individual. Differences in type of an entire epidemic, however, while their cause may be complex, also undoubtedly occur. The fatality rate of epidemics of other diseases varies greatly, it often being lower in centers where the disease has been active over the longest period. Smallpox varies from a mortality of 15 to 30%, to the mild form, practically without deaths, which in the South was called "Cuban itch." Immunity is conferred by Cuban itch, as well as by a severe case of smallpox. It is not improbable that an active immunizing influence is going on constantly, con-

stituting an endemic prevalence of this disease, with relatively few paralyzed cases.

This hypothesis would best explain the age-incidence of the disease, for with a widespread infection, opportunity for immunity is afforded in the first years of life. Theoretically, such a process of immunization would be most active where opportunities for contact were greater, viz: the city. We should have a higher percentage of immunes in the city, and a lesser percentage of susceptible individuals. If this reasoning were sound, we should not only have a lesser number of immune people in the country, but the susceptible group should have a higher age-limit. Is this the case?

The difficulty of separating rural from urban districts is recognized. Statistics are not available at present in Massachusetts in sufficient amount or of a proper character to warrant positive conclusions. I made an effort to determine whether the age limit of those attacked was the same in rural and urban outbreaks. A group of about 20,000 persons in 15 towns where poliomyelitis has occurred, ranging in population from 427 to 22,135, was taken and compared with the worst stricken of our smaller cities, North Adams. The population of the rural group is 23,361; that of North Adams, 22,039. The attack rate was very nearly the same, as there were 19 cases in the rural group and 21 in North Adams.

	Popula- tion	Total Cases	Under 5	5 to 10	10 to 15	15 to 20	Over 20
Rural Group	23,361	19	7	5	3	1	3
North Adams	22,039	21	16	5	0	0	0

In round numbers the percentage may be expressed:

PERCENTAGE OF TOTAL CASES.			
Rural	Under 5	5 to 10	Over 10
Rural Group	37	26	37
North Adams	76	24	0

This difference is striking, and although based on a comparatively small group, is suggestive that the age limit of susceptible age groups may be higher in rural and suburban life. The relation between the percentage of susceptible persons and the age limits of the susceptible group should be studied further. It is reasonable to suppose that, if the opportunities for immunity are less, one would expect a larger proportion of susceptible persons and a higher age limit in the group. For example, measles is ordinarily limited to the lower age groups, but if introduced into virgin soil it attacks all ages, and the immunity of adults in our cities is probably due to infection during the earlier years of life. It would be interesting to determine in a large group of thousands of cases of measles, scarlet fever and poliomyelitis, not only what the real relation between rural and urban prevalence is, but also what percentage of the total is found in the various age groups in city and country.



We have had our share of dreams and theories in this disease. Its analogy in one given particular to another disease has been sufficient to create a theory showing its transmission to be due to the same agencies. As a filterable virus, it suggests yellow fever, and its seasonal prevalence corresponds with the period of greatest activity of the mosquito. It also commonly declines with the advent of cool weather. But yellow fever stops with the first frost, and can start again only when new material is introduced from without, and in the presence of mosquitoes. Poliomyelitis declines in prevalence in the autumn, but continues at a lower rate throughout the winter months, so that the mosquito, even if shown to be a factor in increasing the prevalence in July, August or September, must be exonerated from blame in transmitting the disease through the winter months.

Poliomyelitis bears a certain analogy to rabies. Its predilection for nerve tissue, and what at times at least seems like a protracted incubation, suggest rabies, but evidence is lacking to show that the resemblance goes any further.

Its resemblance to plague in its spread and distribution of cases, lack of secondary cases, etc., has been noted, and the rat and flea combined would explain many of the peculiar epidemiological manifestations of this disease. It is difficult, however, to reconcile its peculiar and consistent age incidence with a flea-borne disease, in which you would expect persons of all ages to be bitten.

This review of the epidemiologic features of poliomyelitis and the known facts in its etiology accentuates the baffling nature of the problem, from the point of view of the health officer. With cholera, plague, yellow fever, he has precise knowledge and can act accordingly, with the expectation of definite results. In poliomyelitis there is no certainty of the details of transmission, no simple diagnostic procedure, no feasible method of determining carriers or the presence or absence of immunity. What we need now is not more theory but more research work, both in the laboratory and in the field, to eliminate or confirm the various theories.

It is well to remember in our research work that a positive result under artificial conditions may be given too much weight in its application to natural conditions. On the other hand, a negative result should not be considered conclusive. Many eminent workers failed to transmit measles to monkeys and others succeeded, because former negative results did not deter them. Often, too, laboratory workers expect the same symptoms in one animal as are presented in man or in the ape.

It is imperative that we be able to find the abortive light cases and carriers. As practical health officers we need a diagnostic procedure that is reasonably specific and comparatively easy in technique to determine the presence of the disease. This is needed, not only in the interest

of the patient, but early diagnosis is essential for the protection of the community in detecting carriers and light cases. We also need a diagnostic procedure reasonably easy of application which will determine the presence or absence of immunity, such as the Schick test does for diphtheria.

There are other needs and possibilities which suggest themselves, a prophylactic for active immunization, and a serum treatment of the disease itself. Two misleading tendencies are apparent, one—general—to look for the facts of this disease in epidemic times only, overlooking its probable endemic prevalence; two—individual—to expect paralysis in every case. To correct these tendencies we need a careful study of diseases of children, including especially diarrhea and enteritis in children under two years of age, regardless of the presence of an epidemic, and we need, not alone the means of accurate diagnosis, but a general willingness to accept this diagnosis in the cases in which paralysis is not apparent.

In the face of our incomplete knowledge, this is no time for dogmatic utterance. We must not eliminate theories or hypotheses, however fantastic, upon mere opinion. We need facts and methods, and careful research work is the only way in which these essential facts and methods of diagnosis can be secured.

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### Original Articles.

#### THE OCCURRENCE AND DIAGNOSIS OF PERICARDITIS.\*

By EDWIN A. LOCKE, M.D., BOSTON.

THE infrequency with which pericarditis is seen clinically, in comparison with the relative frequency of its recognition at the autopsy table, is a striking and singularly significant fact and has led to the statement by one prominent medical writer that the diagnosis of pericarditis is usually a post-mortem one. Although regarded as one of the rarer of the cardiac affections it is without doubt far more common than supposed and by reason of its high mortality should rank next to endocarditis in importance among the cardiac diseases.

Several evident facts can be stated to explain, at least in part, the failure to diagnose such a large proportion of the cases of pericarditis:—

1. The changes in the pericardium, except in the case of direct trauma, nearly always occur as a complication during the course of some other disease. Indeed, it is doubtful if pericarditis is ever primary except in the case of injury or possibly in rare instances of in-

\* Read at the meeting of the Boston Medical Library in conjunction with the Suffolk District Medical Society, Feb. 16, 1916.



fection of the sac by the tubercle bacillus. The cause of the symptoms manifested being known, it is but natural that a complication which too often presents no obvious symptoms or signs should be overlooked.

2. Pericarditis in a majority of cases occurs as a late complication, often terminal, when examination of the heart is most difficult and unsatisfactory and the presence of predominant signs in the chest obscures those due to the involvement of the pericardium. Not infrequently the patient is too sick to be examined thoroughly.

3. Certain types of pericarditis frequently give no characteristic signs or symptoms, those present being reasonably accounted for by the primary disease. In other words, many of the symptoms and signs of pericarditis are common to other intrathoracic diseases, especially those of the heart.

4. Signs, when present, are largely subjective.

5. Perhaps most important of all, the possibility of pericardial involvement is usually, I believe, forgotten and any suggestive symptoms and signs in consequence attributed to the already known condition.

#### AUTOPSY STUDIES.

In an effort to determine as exactly as possible the incidence of this disease among hospital cases, and the possibility of more frequent diagnosis, I have made a careful study of the autopsy reports at the Boston City Hospital for the past nineteen years together with the clinical records of the same cases. I shall confine myself in this brief paper to a discussion of these results and to a consideration of some of the more essential points in diagnosis, in an effort to emphasize the importance of the disease clinically.

The total number of post-mortem sections made during the nineteen years (*i. e.* from 1897 to 1915 inclusive) was 3,683. In this series acute lesions of the pericardium were described in 150, and chronic lesions in 209 instances. Exclusive of these 359 cases of true pericarditis, 88 showed milk patches in the pericardium.

The above figures show that acute pericarditis was found in 4% of all autopsies.

In a rather careful search through the literature on pericarditis I have been able to find but few statistics of this nature. Wells<sup>1</sup> gives quite similar figures. Among 1,048 autopsies on adults he found evidence of acute inflammation of the pericardium in 57, or 4.5%, and chronic inflammation in 71, or 6.8%, a total of 128 cases, or 11.3%. In 220 necropsies at the Boston Consumptives' Hospital on individuals dying of tuberculosis 16, or 7.3%, showed pathologic processes in the pericardium. These rather astonishing figures indicate that pericardial complications must be relatively common clinically and especially since a large percentage of cases with pericarditis do not succumb.

A comparison of the above figures with similar ones for acute endocarditis emphasized still further the clinical importance of pericarditis. In the above mentioned 3,683 autopsies, acute endocarditis was described in 185, or 5%, and chronic endocarditis in 462, or 12.6%, making a total of 647 cases of acute and chronic endocarditis, or 17.6%. If this series of 3,683 be accepted as representative, which seems reasonable, we may say that the relative frequency of acute pericarditis and endocarditis as found at autopsy is in the ratio of 1:5 and in the case of the chronic lesions of 5:7:12.6, or, if the acute and chronic cases are combined, of 9:7:17.6.

With the purpose of gaining some definite idea of the possibility of accuracy in the diagnosis of pericarditis I have examined all the clinical records of the 150 cases of the acute form. In only 27 instances, or 17%, is there any clear evidence in the clinical notes of the presence of disease of the pericardium. In the majority of cases the data are very meagre and exact inference as to the type and extent of the lesions is consequently impossible. A detailed study of the particular types of pericarditis found reveals an even greater deficiency in the clinical work. The most glaring errors are in the cases of pericarditis with effusion of various forms. There was a total of 17 cases, with an effusion of 200 c.c. or more, the amount varying from this minimum to a maximum of 1,000 c.c. In not a single instance does the history contain any positive diagnosis of the effusion and in only 3 is the description even moderately suggestive of fluid. The 3 cases with the largest effusion, *i. e.* 500, 750 and 1,000 c.c., were unsuspected if one may judge by the records. A rub was mentioned in only 2 instances among 42 cases of fibrinous pericarditis.

One must admit that these statements are somewhat unfair to the clinician as no allowance is made for incomplete clinical notes, yet after generous allowance is made it must be admitted that the record is an astonishing one. In at least 50% of cases, I believe, it should be possible to diagnose the condition with reasonable certainty.

Greater accuracy in diagnosis means that of all a general knowledge of the relative frequency of the various types of pericarditis of the diseased condition with which pericarditis is commonly associated. In the following table are given the 159 pericarditic autopsies of pericarditis described in the clinical records according to the type of lesion.



TABLE I.

TYPES PERICARDITIS	No. CASES	ACUTE		CHRONIC	
		PERCENT- AGE	No. CASES	PERCENT- AGE	
Fibrinous	42	28.00	17	8.13	
Serofibrinous	33	22.00	82	39.24	
Haemorrhagic	4	2.67	5	2.39	
Purulent	39	26.00	3	1.44	
Tuberculous	0	0.00	5	2.39	
Adhesive—partial	14	9.33	30	18.66	
Adhesive—total	18	12.00	57	27.27	
Calcified	0	0.00	1	.48	
TOTALS	150	100	209	100	

It will be noted that in the group of acute cases the largest number are of the so-called fibrinous type although the fibrinous, serofibrinous, purulent and adhesive forms are found with about equal frequency, the limits being 21.33 and 28%. The serofibrinous, purulent and haemorrhagic, which we recognize clinically as pericarditis with effusion, together represent 50.7% of the total acute cases.

Among the chronic types the serofibrinous and adherent forms distinctly predominate. This last mentioned group comprises approximately 46% of the total.

These figures show a close correspondence with those of Breitung<sup>2</sup> (Table II) who found 324 instances of acute and chronic pericarditis among the post-mortem cases at the Berliner Charité during a period of eleven years.

TABLE II.

TYPES	No. CASES	PERCENT- AGE	
Pericarditis serofibrinosa	108	33.33	
Pericarditis haemorrhagica	30	9.26	
Pericarditis purulenta	24	7.41	
Pericarditis tuberculosa deuteropathica	24	7.41	
Pericarditis tuberculosa idioopathica	2	.62	
Pericarditis adhaesiva partialis	111	34.26	
Pericarditis adhaesiva totalis	23	7.09	
Pericarditis ossificans	2	.62	
SUMMA	324	100	

It seems probable that among the cases seen clinically in a general hospital the fibrinous type predominates to a far greater degree than would appear from pathologic statistics. As a rule they are the mildest and occur with the less seriously ill patients with whom recovery is unquestionably much more common.

In the fatal cases of pericarditis with effusion, at least, the serous and the purulent forms of the acute type seem to play approximately equal parts, as indicated in Table I, while in the chronic cases serous fluid is almost invariably the type of fluid present. True haemopericardium is rare in both the acute and chronic cases although blood-tinged exudate is by no means uncommon. Including the 4 cases of true haemorrhagic pericarditis, blood-tinged fluid was found in 17 instances, or 11%, and in association with the following primary diseases: nephritis 3, septicaemia 2, empyema 2, aortic aneurysm 1, rheumatism 1, pneumonia 1, tuberculosis 1, and unclassified 6. Among the chronic cases, and including the five cases of true haem-

orrhagic pericarditis, the fluid was of this form in only nine, or 4%. Pericarditis with effusion in the aged is said to be commonly haemorrhagic. (Osler.) This does not hold true in the cases tabulated above.

#### THE PRIMARY DISEASE IN PERICARDITIS.

The question of the nature of the primary disease in pericarditis is naturally of first importance to the clinician as especially indicating the conditions under which pericarditis most frequently arises. Wells<sup>3</sup> gives the possible channels of infection to the pericardium as follows:—1. the blood stream; 2. the lymph vessels; 3. direct infection by trauma; 4. by extension which must be from, *a.* heart or blood vessels within the pericardium; *b.* mediastinum; *c.* pleura; *d.* peritoneum. With these various possible modes of invasion it is obvious that pericarditis may arise in the course of a very large number of diseases. Any attempt at classification of these primary diseases is unsatisfactory but in the interest of conciseness I shall offer the following grouping:

1. *Trauma and perforation of the pericardium.*
2. *Infectious diseases* (e. g. rheumatism, chorea, pneumonia, tuberculosis, meningitis, scarlet fever, influenza, smallpox, typhoid, syphilis, gonorrhoea, actinomycosis.)
3. *Local or general septic processes* (e. g. septicaemia, pyaemia, osteomyelitis, tonsillitis, erysipelas, local abscesses.)
4. *Chronic diseases, usually as a terminal complication* (e. g. nephritis, advanced tuberculosis, carcinoma.)
5. *Chronic intoxications and poisonings* (e. g. gout, diabetes, phosphorus poisoning.)
6. *Extension or irritation by contiguity from neighboring structures* (e. g. diseases of mediastinum, pleura, lungs etc.)
7. *Affections of the heart and aorta* (e. g. endocarditis, affections of the myocardium, aortic aneurysm.)
8. *Blood diseases and haemorrhagic diatheses* (e. g. severe anaemia, leucaemia, haemophilia, purpura, scurvy.)

The majority of all cases of pericarditis are found associated with only a few of the conditions mentioned above. Taking into consideration all ages rheumatism is unquestionably the commonest cause. The infrequent finding of this condition at autopsy secondary to rheumatic fever is easily explained by the fact that this disease seldom runs an acutely fatal course, death, if occurring, being due to complications of long standing. In the 150 cases of acute pericarditis studied at the Boston City Hospital, rheumatism was evident as the primary disease only twice. Autopsy statistics of chronic pericarditis show a considerable percentage to be due to this disease. On the other hand the incidence of pericarditis in acute rheumatism, as given by different authors, varies within rather



wide limits (Latham 13%, Peacock 16%, Sibson 19%, Pye Smith 22%, Whigham 17%, Osler 6%).<sup>4</sup> The total number of cases of acute rheumatism included by these authors is 2,080 and the occurrence of pericarditis 344, or 16%. Eichorst places his estimate as low as 3% and von Schrötter as high as 30%.<sup>5</sup> Huchard quotes the statistics of many authors on this point which vary from a minimum of 10 to a maximum of 75%. All authorities are agreed that acute rheumatism as an etiologic factor is largely confined to youth and early adult life.

Pericarditis occurs with such a considerable variety of other diseases that it is difficult to give any precise statement of their order of frequency. In adults pneumonia and pleurisy probably come next to rheumatism in importance. With the former disease the type of pericarditis is often frankly purulent although in some instances the pneumococcus may be recovered from the exudate in the absence of pus. These cases even when purulent are, furthermore, not always fatal. The development of pericarditis with pneumonia is quite directly dependent on the severity and extent of the process in the lungs, being most common in those cases with bilateral involvement and more frequent with consolidation of the lower than of the upper lobes.

Septic processes, especially septicaemia or pyaemia, and those of the pelvic organs or bones, quite commonly lead to pericardial complications and are particularly prominent in the fatal cases. The pathologic type of changes in the pericardium is variable but the exudate is commonly purulent although a rather large percentage of the cases of adherent pericardium are of this origin.

Pericarditis is generally acknowledged to occur with nephritis, but it is difficult in many instances to establish a definite relationship between the two. Some authors consider nephritis to be a very common cause of the condition, while others regard it as rare and due not to the disease in the kidneys, but to some associated pyogenic process. It is especially observed with the chronic nephropathies. Any type of pericarditis may occur and if an effusion is present, it is sometimes haemorrhagic.

A less common cause of pericarditis is tuberculosis of the thoracic organs or acute miliary tuberculosis. The changes in the pericardium may be identical with those found in association with other diseases or be strictly tuberculous.

TABLE III.

TABLE OF 150 AUTOPSY CASES OF ACUTE PERICARDITIS ARRANGED TO SHOW THE NUMBER OF THE DIFFERENT TYPES OCCURRING WITH VARIOUS DISEASES.

NUMBER OF CASES OF EACH TYPE OF PERICARDITIS.

PRIMARY DISEASE	EFFUSION	SPERMATOPHYTES	ABSCESSES	ADHERENT PERICARDIUM	HAEMORRHAGIC	TOTAL
Pneumonia	20	13	20	5	5	63
Empyema	1	5	1	1	1	6
Abscess Lung	1	1	1	1	1	1
Aortic Aneurysm	2	1	1	1	1	5
Acute Endocarditis	1	1	1	1	1	1
Tuberculosis	1	2	2	1	1	7
Local or General						
Sepsis	10	6	9	1	1	28
Nephritis	1	4	2	3	3	16
Meningitis	1	1	2	1	1	3
Rheumatism	1	1	1	1	1	2
Cirrhosis Liver	1	1	1	1	1	1
Not Determined	1	5	1	1	2	17
TOTALS	63	33	62	14	14	150

In how large a percentage of these the involvement was terminal and thus due to secondary infection it is impossible to say, but from a careful reading of the clinical histories and study of the autopsy reports, it is evident that the percentage is a rather large one. Pneumonia, empyema and abscess of the lung together comprise 47%.

It is difficult to state exactly the relation of age to the incidence and type of pericarditis. Statistics show that the disease is much more common in childhood than in adult life. In infancy, broncho-pneumonia and empyema play the most important rôle as etiologic factors. Throughout childhood rheumatism remains at the head of the list. During early adult life, the most frequent causes are rheumatism, pneumonia, tuberculosis and bone diseases. After thirty, rheumatism is relatively rare while pneumonia becomes an increasingly important cause. In old age, pneumonia and chronic nephritis are the most frequent. Blechman.<sup>6</sup> At all ages septic processes figure prominently in the etiology.

TABLE IV.

TABLE OF 150 AUTOPSY CASES OF ACUTE PERICARDITIS ARRANGED BY AGE PERIODS ACCORDING TO PRIMARY DISEASE.

PERIOD OF LIFE	Infancy	Childhood	Adolescence	Early Adult	Adult	Old Age	Total
Pneumonia	1	4	8	14	6	7	40
Empyema	1	1	1	1	1	1	6
Abscess Lung	1	1	1	1	1	1	6
Aortic Aneurysm	1	1	1	1	1	1	6
Acute Endocarditis	1	1	1	1	1	1	6
Tuberculosis	1	2	1	1	1	1	7
Local or General							
Sepsis	10	6	9	1	1	1	28
Nephritis	1	4	2	3	3	3	16
Meningitis	1	1	2	1	1	1	7
Rheumatism	1	1	1	1	1	1	6
Cirrhosis Liver	1	1	1	1	1	1	6
Not Determined	1	5	1	1	2	1	17
TOTALS	17	28	37	41	28	23	150



## SYMPTOMS AND SIGNS OF PERICARDITIS.

I shall discuss briefly only the more important of the symptoms and signs of pericarditis. The symptoms of this condition are seldom characteristic and it is, perhaps, the rule that an unsuspected pericardial involvement is found on careful routine examination or because sought for in those diseases with which it is known to be frequently associated. At other times the possibility of trouble in the pericardium is suggested by the sudden increase in the severity of the symptoms during the course of a critical illness. In spite of the most careful observation, however, definite evidences of the disease may be entirely absent throughout its course. West<sup>7</sup> has particularly called attention to these last mentioned cases which he speaks of as the "latent type." Chronic pericarditis, and especially the adhesive form, is often found post-mortem without any suggestion of the condition having been present during life. He further speaks of certain acute cases where the process is confined to the posterior portion of the pericardium and therefore friction sounds never become audible or only many days after the appearance of symptoms which make the diagnosis probable. West considers that latent cases are very commonly due to gout or chronic nephritis.

The clinical picture is difficult to give. It depends on many factors, but chiefly, the nature of the process, whether acute or chronic, the character and amount of the exudate, the condition of the heart muscle and endocardium and the presence or absence of complications (Sinnhuber).

In not a few, the onset is more or less well marked. The patient becomes restless, breathes with a shallow, rapid respiration, looks distressed and anxious, the face has a dusky pallor, and he often complains of pain or oppression in the region of the precordia. Nausea and vomiting, which are rather common late symptoms in the fatal cases, are occasionally met with at onset. Bramwell, in speaking of the onset of pericarditis says, "the experienced eye can often detect that something has occurred, that the patient is not so well as he was at the previous visit"; and this, I think, expresses very well the vague clinical picture which is often presented. An initial chill is rare. Pain so often met with as an initial symptom, varies from a vague sensation of pressure or distress in the region of the precordia, to the most intense and agonizing stabbing character. Sibson<sup>8</sup> observed pain in 70% of his cases. It is said to be most common in pericarditis with effusion although in this same type pain may be entirely absent from first to last. If pain appears early it invariably disappears with the development of an effusion. Epigastric pain may be present with large effusions (Sibson). Especially in children pressure over the precordia or deep inspiration frequently increases the pain, rarely also the skin may

be extremely hyperaesthetic. Pressure in the epigastrium just below the xiphoid cartilage or at the costal angles often induces a severe pain reaction. The temperature is apt to show a more or less definite rise with the beginning of inflammation in the pericardium but is in no way characteristic.

The pulse and respiration are much more disturbed as a rule ("Perverted pulse-respiration ratio," West).<sup>9</sup> Sometimes the respiration reaches 60 or 70 per minute and is excessively labored and shallow. Shortness of breath is common and with large effusion often becomes extreme orthopnoea. Cases of paroxysmal dyspnoea have been described.

With marked effusion the patient often assumes a sitting posture and sometimes will be found with the legs and thighs strongly flexed and resting with the arms on the knees. Hertz<sup>10</sup> describes this as an important sign of pericarditis with effusion and terms it the "knee-chest sign." Wynter<sup>11</sup> lays particular stress on the absence of abdominal respiration as a sign of pericarditis. He states that the diminution in respiratory movements in case of diseases of the lungs and pleura is usually not marked and is one-sided, but in pericarditis it is bilateral and often entirely absent. This author considers it frequently to be as marked as in abdominal diseases but always rigidity and general tenderness are for the most part lacking. This diaphragmatic paresis he explains on the grounds of reflex inhibition due to involvement of the diaphragm secondary to inflammation in the pericardium. His observations lead him to consider it one of the earliest and most reliable of the symptoms of pericarditis and quite as common with the fibrous as with the serofibrinous form. It affords a reasonable explanation of the upright position so frequently taken by the sufferer.

Cough of a short, irritative, spasmodic character may be present as in pleuritis.

The initial excitement and restlessness may give place to a more or less marked condition of drowsiness after pericarditis is well established. Delirium, even of a most intense nature, is occasionally seen, and rarely coma.

Later symptoms of pericarditis depend largely on two general factors: first, the degree of cardiac embarrassment, and second, pressure from the distended pericardial sac. The first condition is chiefly caused by paralysis of the diaphragm and direct influence on the heart muscle in consequence of the local inflammation. The pericardial sac is firm and inelastic but, when inflamed, is easily stretched, and consequently an enormous effusion may cause very few cardiac symptoms (MacKenzie). Cardiac disturbances, such as extra systole and auricular fibrillation, are probably due not to the pericarditis but to a preëxisting diseased myocardium (Cowan).

The symptoms from pressure from the distended sac are among the latest and most severe. Through pressure on the lungs, the breathing



is especially embarrassed, leading to the intense dyspnoea or orthopnoea, cough, etc., mentioned earlier. Venous engorgement, especially of the veins of the neck, may reach an extreme degree, while cyanosis may be more intense than is seen in almost any other condition. Oedema is rare. Pressure on the left recurrent laryngeal, as in aneurysm and mediastinal growths, probably explains hoarseness and aphonia. Hiccough is occasionally seen and is probably the result of pressure on the phrenic nerves at the point where they pass down over the pericardium. Difficulty in deglutition is at times observed and swallowing may be impossible except in the sitting posture.

#### PHYSICAL SIGNS.

The physical signs of pericarditis are hardly more numerous than the symptoms but in general are much more characteristic and important. To a greater degree it is true that the signs vary considerably with the type of lesions and degree of involvement present.

In the early stages the first and most important sign is the friction *frmitus* or rub. The type of friction and its intensity depend on the nature of the exudate and force of the heart's contraction, and is variously described as "rushing," "rustling," "whiffing," "harsh," "rough," "grating," "creaking," "scratching," etc. In its general quality it may resemble closely the pleural rub. As a rule the friction murmur is double, the "to and fro" sound, though fairly commonly it occurs as a single sound or very rarely triple, the "cantering horse" type. Occasionally it is practically continuous and so prominent as to obscure the heart sounds completely. In time the sounds, although often described as synchronous with those of the heart, are not quite so, hence the terms "mesosystolic" and "mesodiastolic" employed by some authors. Sibson emphasizes the fact that the pericardial sounds never begin or end with a shock and are characterized by the same intensity throughout. They may be intensified, however, by any increase in force of the heart's contraction, by sitting forward when upright or rarely by taking the recumbent position. They appear superficial and pressure of the stethoscope may occasionally augment the intensity.

In contrast to endocardial sounds they have no definite area where they are best heard nor paths of conduction. The commonest areas where they are heard are at the base and over the middle portion of the heart. It is usually stated that these sounds are never audible beyond the area of cardiac dullness or in the back, but a sufficient number of cases are reported to make it seem probable that in a not insignificant percentage the rub is heard over a relatively wide area of the thorax and in the lower left back also. Panly,<sup>12</sup> Devie, E. et Gardère, C.,<sup>13</sup> Paviot, J. et Delaetanal, J.,<sup>14</sup> and others have discussed this subject at length. In cases where the rub is heard beyond the heart limits, propaga-

tion is chiefly by the hypertrophied heart which is held close to the chest wall, but also to a varying extent by the thorax wall, indurated lung or possibly to some extent by the liver. The fact that friction is seldom audible in the back is not due to the fact that the posterior part of the pericardium is not involved, but because the sounds are successfully muffled by the interposed lower lobe of the left lung. When they do appear in this region the explanation is probably to be found in the fact that the greatly enlarged heart or the presence of a pericardial effusion either push the lung aside, or more probably render the lower lobe atelectatic in either case, the conditions being more favorable for the transmission of the sound. The murmur thus heard in the back is not transmitted from the anterior surface but produced in the posterior part of the pericardium. An especially important consideration is the fact that the rub may be present for only a very brief period, and thus escape observation.

A tactile thrill over the pericardium of a harsh, vibratory character, is a familiar sign (Sibson, 20%). It is felt over the same area as the audible friction. As in the case of the friction sounds it is apt to be transitory and change from day to day.

With the development of effusion of any force other more or less characteristic signs may appear. In youth, where the chest is still pliable, bulging over the region of the precordium is sometimes seen, likewise with large effusion the epigastrium may appear full and immoveable.

With the accumulation of fluid, the palpable impulse ordinarily weakens, is more diffuse and moves upwards, at times reaching the third space. Coincidentally the heart sounds become weaker and muffled. West<sup>15</sup> believes that one of the first results of pericarditis is involvement of the adjacent muscular tissue of the heart and consequently dilatation of this organ which is a factor in the alteration in the cardiac sounds. The friction sounds may or may not disappear as the fluid increases.

The amount of effusion necessary to be recognizable is a matter of some difference of opinion. Probably at least 150 to 200 c.c. must be present to give definite percussion signs. Small effusions

The shape of the fluid-filled pericardium is mapped out by light percussion. The limits are described as pyriform or oval and the fluid limits are much larger than the heart limits, and, even in the extreme cases, the heart is not at this point altered in position. The fluid is sharply demarcated from the heart by a shadowed area, the fluid being more easily lowered than the heart.

After removal of the fluid the heart is found to be in its normal position. The fluid limits are much larger than the heart limits, and, even in the extreme cases, the heart is not at this point altered in position. The fluid is sharply demarcated from the heart by a shadowed area, the fluid being more easily lowered than the heart.



The right border passes downward less diagonally than the left to meet the line of liver dulness at an obtuse angle. Attention was directed to the dulness in the fifth interspace to the right of the sternal edge by Rotch,<sup>16</sup> who considered it one of the earliest signs of pericarditis with effusion.

The lateral limits of dulness vary slightly with change in position. Similarly, the impulse may not be felt in the prone position, but palpable when the patient sits up and forward.

Pressure signs of the effusion are of considerable moment. Ewart<sup>17</sup> described a "first rib sign," *i. e.*, under these conditions the upper edge of the first rib can often be felt, due to the fact that the clavicle is raised, thus relaxing the ligament between the two bones. The liver and diaphragm may be considerably pushed downward. Calvert,<sup>18</sup> under the title "A New Sign Differential between Dilatation of the Heart and Pericarditis," published the result of his work which he believes shows that in pericarditis with effusion, the right lobe of the liver is low, varying in position from the fifth interspace to the sixth rib, while in dilatation of the heart, the lobe of the liver is high, in position from the fourth to the fifth rib.

The most striking signs of pressure are those due to compression of the lungs. Bamberger<sup>19</sup> first described a small quadrilateral patch of dulness low down in the intrascapular space on the left. Many authors have since called attention to the altered physical signs in this region. In my experience changes are nearly uniformly found near the inferior angle of the scapula on the left in cases of massive effusion in the pericardium. The most constant sign is dulness of varying degree, usually marked, sometimes accompanied by diminished fremitus and respiration and at others by a more or less intense bronchial type with increased voice sounds. Rarely bronchophony or egophony is present. In a few instances I have been able to demonstrate a considerable lessening of the above signs when the patient leaned forward in a sitting position. These signs just described are sometimes so striking as to lead to a diagnosis of pneumonia.

#### CHRONIC ADHESIVE PERICARDITIS.

This sequel of acute inflammation of the pericardium is by no means rare but so frequently escapes detection that it is not given deserved prominence among the forms of pericarditis. Pitt<sup>20</sup> states that among 10,000 post-mortem examinations at Guy's Hospital he found 400 cases of acute pericarditis and about the same number of the adherent form of which one-sixth showed universal adhesions. Smith<sup>21</sup> found among 3,053 autopsies at the Massachusetts General Hospital (1897-1913) complete or partial obliteration of the pericardium in 62. In my own series of 3,683 autopsies partial or complete obliteration of the pericardium sac was

found in 32 instances among the acute cases, or 21%, and in 96 of the chronic cases, or 46%.

The picture of adherent pericarditis is quite as varied as the degree and nature of the anatomic changes, and with few exceptions is an indefinite one. It may present a considerable variety of phenomena or none, according to the degree of disturbance of the circulation and respiration.

Laennec<sup>22</sup> records his observation that "adhesion of the heart to the pericardium frequently does not interfere with the exercise of its function." The accuracy of his conclusions has been established by many clinicians since Laennec's time. If the adhesions be confined to the heart and its enveloping sac, even though the fusion between the serous surfaces is complete, the embarrassment to this organ is trifling and does not lead to hypertrophy or dilatation. It is only when the pericardium becomes glued to adjacent structures, either posteriorly to the mediastinum, anteriorly to the chest wall or below to the diaphragm and therefore more or less fixed ("Symphyse pericardique," "chronic mediastino-pericarditis") that the movement of the heart is impaired. The resulting disturbances are purely mechanical and affect the heart, the venous circulation and the respiration. All symptoms and signs are directly referable to this "impediment to the passage of blood through and out of the heart" and to the interference with respiration during inspiration.

Pitt<sup>23</sup> suggests that the resulting interference with movement, size and efficiency of the heart, probably depends on whether the heart remains dilated a sufficient time to permit adhesions to become firm, in which case it can never contract. If, on the other hand, the heart adjusts itself while the adhesions are soft, permanent impairment need not result. Later, when the adhesions are firm and fibrous, the pericardium may be so completely fixed as to prevent subsequent dilatation. The exact mechanism by which the above mentioned results are brought about has been ably discussed by Keith,<sup>24</sup> Wenckebach,<sup>25</sup> and others.

Pick,<sup>26</sup> in 1896, described a form of adherent pericarditis accompanied by cirrhosis of the liver, extreme ascites without jaundice, and oedema of the legs, which is often mistaken for hepatic cirrhosis and to which he gave the term "pericardial pseudo-cirrhosis of the liver." Cases of so-called "multiple," "poly-serositis," or "polyorrhomenitis," probably form a part of this same general group.

All cases of adherent pericarditis then fall roughly into one of three groups: first, those of simple fusion between the serous surfaces of the pericardium and which are usually without characteristic signs or symptoms and therefore seldom recognized clinically; second, those cases with adhesions of the pericardium internally and externally, the clinical picture of which is that of cardiac and respiratory failure; third, those cases of extensive intra- and extra-peri-



cardial adhesions and also evidences of extensive general involvement of other serous surfaces.

Regarding the symptoms of adherent pericardium little need be said. They are essentially those due to respiratory embarrassment and to cardiac insufficiency. Cyanosis and dyspnoea are usually present in all severe cases. Orthopnoea is often seen. Pain is rare. General oedema sometimes occurs in the severest forms.

#### PHYSICAL SIGNS OF ADHERENT PERICARDIUM.

Although a considerable list of signs can be mentioned none are constant or if present, strictly pathognomonic. Practically all are, as in the case of the symptoms, the direct result of fixation of the intrathoracic structures, especially the heart; and therefore concerned especially with the circulation and respiration.

Depression of the chest wall over the whole or a portion of the precordial area may be seen, less commonly a moderate degree of bulging. Neither condition can be considered as characteristic of this form of pericarditis, however. The position of the apex beat is to a varying degree fixed, and Achelis<sup>27</sup> considers this defective displacement with change in position or respiration, of the first significance diagnostically. It is frequently considerably displaced outward as is characteristic of cardiac dilatation. More commonly than otherwise, it is raised, being palpable only in the third and fourth spaces, rarely also in the second. Marked variation in the nature, force and area over which the cardiac impulse is felt is also common.

Among the most trustworthy signs, if the heart be adherent to the anterior chest wall, is the retraction of the intercostal spaces with ventricular systole, usually most striking in the area of maximum impulse but often also over more or less of the entire precordia. Less constantly a systolic recession is to be observed in the epigastrium resulting from extensive adhesions between the pericardium and diaphragm. With the patient in a sitting position a common phenomenon is a retraction of the lower ribs in the left posterior and lateral aspects of the thorax, "Broadbent's sign." Broadbent<sup>28</sup> explains this as resulting from the upward displacement of the diaphragm with each systole of the heart, which pulls the false ribs inward. Rarely this sign has been observed by this author and others to be present with a greatly enlarged heart, but in such cases the movement varies with respiration, which never occurs when due to adhesions of the pericardium (McKenzie). In my experience, this sign, when present, is one of the most distinctive of adherent pericardium. Bramwell<sup>29</sup> regards the diastolic rebound or shock, often over the chest wall in the region of the palpable impulse, as highly characteristic. Similarly a systolic impulse may in rare cases be heard or felt posteriorly.

One of the most commonly described signs is

the so-called "pulsus paradoxus," "pulsus inspirationis intermittens" or "Kussmaul's sign," that is, a variation in the pulse associated with respiration, the rate becoming slower and the force less with inspiration. The sign occurs in other conditions as well, and is by no means constant or definite in this form of pericarditis and therefore is of doubtful value.

Kussmaul<sup>30</sup> has called attention to the swelling in the cervical veins synchronous with inspiration, which he explains as due to the fact that the adherent pericardium prevents the dilatation of the right ventricle, which normally occurs during the first part of respiration. Sudden diastolic collapse of the jugular vein was described by Friedrich<sup>31</sup> and considered by him an important sign.

Auscultation yields nothing worthy of special mention. If the union of the visceral and parietal pericardial surfaces is not universal, a rub may be present. Betz<sup>32</sup> has described a "peculiar blowing or whistling systolic sound" which he regards as characteristic of adhesions of the pericardium to adjacent tissue.

#### X-RAY EXAMINATION.

It is hardly possible to emphasize too strongly the importance of an x-ray examination in the diagnosis and differential diagnosis of pericarditis. In all forms of inflammation of the pericardium with fluid exudate or adhesions, it furnishes in many instances more reliable data than either the symptoms or signs. It is true, however, as with other intrathoracic conditions, that the diagnosis should never be made on the x-ray findings alone, but only when these are considered together with the clinical symptoms and signs. There seems to be a general agreement among writers on the subject that the normal pericardium cannot be differentiated from the heart shadow, but Rönfeldt, after a careful study of a large series of cases, concludes that the normal can be made out in about one third.

Simple fibrinous changes in the pericardium give no positive x-ray findings. With small effusions into the pericardium the x-ray examination likewise furnishes no aid to diagnosis, but with larger amounts of fluid, certain features make the form of the heart shadow quite distinctive. With few exceptions, the outline of the shadow of the distended pericardium in the roentgenogram corresponds fairly closely to the area of dullness mapped out by percussion. The shadow is large, the outline rounded, or more or less triangular in shape, depending on the amount of fluid. Its broad base is directed often reaching the outer limits of the thorax on the left, and from there to the middle of the sternum on the right, or the middle of the sternum on the right, and the rounded apex is directed toward the cardiac angle, often overlapping the heart shadow so commonly seen in pericarditis. The shadow, except in the case of small effusions, is not triangular in this position. In the lateral position the angle is a right angle, the apex directed toward the cardiac angle, and the base is directed toward the middle of the sternum.



greatly diminished or entirely effaced. The shape of the area varies significantly with changes in position. In contrast to the shadow of an enlarged heart, the pulsation usually observed at the left border is absent. Wessler<sup>34</sup> thinks this may also be the case in dilated heart. Above, the shadow is somewhat raised and encroaches on the great vessels at the base of the heart. In the upper one-third of the left border there is commonly a varying degree of concavity of the outline on the left, corresponding to the so-called "Sibson's notch." If combined with adhesions within the pericardium the outline of the distended sac may not be uniform and even marked bulging, especially to the left, is rarely seen (Wessler).

The x-ray appearances in adherent pericardium have been the subject of much careful investigation by Lehmann and Schmoll<sup>35</sup> Achelis,<sup>36</sup> Tornai,<sup>37</sup> Vaquez and Bordet,<sup>38</sup> and others, and the essential features appear to be well established. Much of a rather technical nature has been written, especially by the above observers, regarding the methods of x-ray examination, which does not fall within the scope of this paper. Uncomplicated obliterative pericarditis cannot be certainly demonstrated by roentgenograms.

The practical conclusions of the above authors as to the characteristics of adherent pericardium in roentgenograms may be summarized as follows:

1. With adhesions of the pericardium to the anterior wall of the thorax, the clear space between these two structures is much diminished or obliterated where an x-ray examination is made in the oblique or lateral position. Achelis urges caution in drawing too definite conclusions from such findings, as this obliteration may be present in the case of extreme cardiac hypertrophy.

2. The outer limits of the shadow laterally do not appear smooth and clear as in hypertrophy or dilatation of the heart, but are vague and indefinite and frequently with notched or tooth-like outline due to adhesions.

3. The normal angle on either side between the pericardium and diaphragm is sometimes completely filled in by adhesions.

4. An indistinct or obliterated heart pulsation is seen.

5. Various modifications in the displacement shadow of the heart, with respiration and change of body position, are also characteristic.

6. The diaphragm shows varying degrees of immobility during respiration.

7. In the lateral position a posterior mediastinal pericarditis is shown by obliteration of the normal triangular clear space.

#### PARACENTESIS PERICARDII.

Whether for diagnosis or for therapeutic purposes aspiration of the pericardium is a procedure altogether too little known. During the past ten years many authors have urged the

more frequent employment of paracentesis in pericardial effusions and in consequence it is now unquestionably much more often done than formerly.

Considering the relative frequency of pericarditis, and its favorable course with spontaneous recovery in many instances, it must be admitted that paracentesis is rarely necessary. It is indicated when the amount of effusion is so great as to give extreme embarrassment of the respiration and circulation and thus endanger life, or when a large effusion shows no tendency to absorption. In occasional cases it is important to establish the nature of the effusion, especially when a purulent exudate is suspected. Sears<sup>39</sup> has emphasized the importance of exploratory puncture in all suspected cases of this type, urging the advantage of early radical treatment of pyopericardium on the same grounds as of pus in the pleural cavity. The favorable results of surgical treatment by pericardiotomy during recent years offers a weighty argument for early aspiration for diagnosis.

Puncture of the pericardium is far less simple than of either the pleural or peritoneal cavities and is by no means free from dangers. A dry tap is not infrequent even when a considerable amount of fluid is present,—a failure which is explained by the fact that adhesions binding the heart to the pericardium may make it difficult to reach the fluid or because the exudate is apt to contain a large amount of fibrin with which the needle may become plugged. The x-ray examination is often of great value in indicating the position of the fluid in the pericardial sac.

The possible untoward results of paracentesis of the pericardium are several. A few cases are on record of sudden collapse and death immediately following it. The dangers of infecting the pericardium are but slight and can be disregarded if strict attention be given to asepsis. An ever present possibility is the puncture of the pleura and infection of this cavity if the pericardial exudate is purulent. The gravest complication but, fortunately, a rather rare one, is the wounding of the heart, leading to fatal haemorrhage. Boxwell<sup>40</sup> reports such a case where the ventricle and auricle were punctured and death resulted from hemorrhage. The dangers from this cause seem to be not so much from puncture as of tearing of the heart muscle by movement of the heart over the end of the needle.

The question of the best site for aspiration is a matter of wide difference of opinion and a great variety of points have been recommended. From the work of Zinn,<sup>41</sup> Blehmman,<sup>42</sup> Schaposchenko and Damsch,<sup>43</sup> and others, it is clear that the least amount of the effusion collects in front of the heart, the bulk of the fluid being in the posterior and left dependent portions of the pericardium. The right side of the diaphragm meets resistance from the liver and cannot be pressed down as on the left, where the resistance is less, and therefore the accumula-





FIG. 1. MALE, 22 YRS. Pericarditis on the first day. (FIGURE 1.)  
Note enormous increase in transverse diameter of heart shadow, obliteration of shadow of  
enrichment of shadow on great vessels, acute cardio-pericardial angle on right and loss of  
of heart on left.



FIG. 2. MALE, 22 YRS.  
N.Y.





FIG. III. SAME CASE AS FIG. II, BUT TWO MONTHS LATER.

Note striking increase in size of heart shadow due to increase in pericardial effusion.

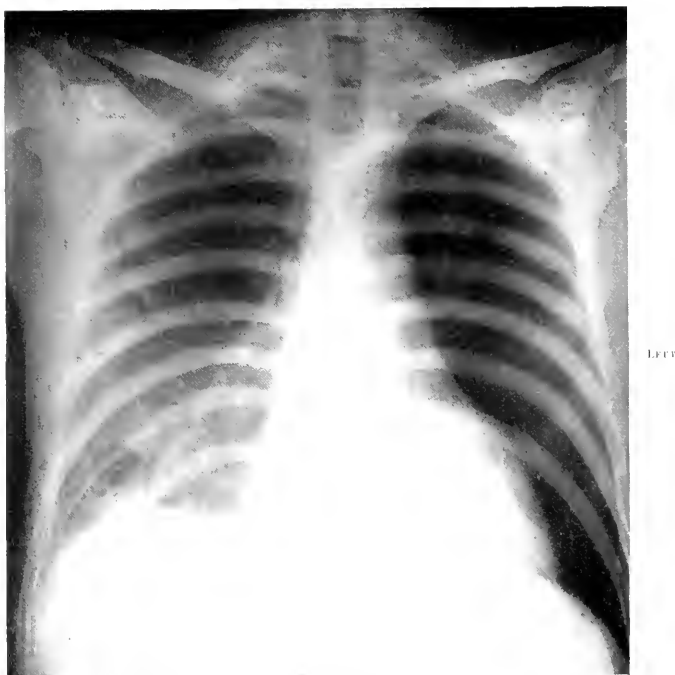


FIG. IV. MALE, 36 YRS. ADHERENT PERICARDIUM WITH MODERATE EFFUSION FOLLOWING PNEUMONIA.

Note particularly the characteristic obliteration of the acute cardio-hepatic angle on right.



tion of exudate in the right lower part of the pericardium is usually small in comparison. This would seem sufficient reason for not choosing the fifth right intercostal space (Roth's Point) as the site for paracentesis. Likewise for the same reason the various points to the left of the sternal border, either inside or outside the internal mammary artery, are unsuitable. Furthermore, the dangers of wounding the heart are greatly increased in this region.

The region most commonly chosen (Curschmann, Zinn, West, Sears, and many others) is the fifth or sixth interspace, 2-3 cm. outside the nipple line and inside the outer limits of dullness. The position is one of the most favorable for drainage of the pericardium and the chances of injury to the heart very slight. The needle introduced at this point may transfix the pleura, but this accident is of little or no importance.

One other point of puncture has come much in favor of late, namely, the sub-xiphoid of Marfan.<sup>44</sup> The advantages of this method as stated by Marfan are as follows. 1. The distended pericardial sac lies very close to the xiphoid and is very easily entered; 2. The sac is punctured at its lowest part and can therefore be more easily and completely drained; 3. There is no danger or injury to the heart; and 4. There is no possibility of entering the pleural cavity. Blechmann<sup>45</sup> and Rieux<sup>46</sup> believe this to be the most satisfactory and safest method.

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## A SECOND NOTE ON THE FREQUENCY OF EPILEPSY IN THE OFFSPRING OF EPILEPTICS.

By D. A. THOM, M.D.,

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SINCE publishing my early investigations concerning the Frequency of Epilepsy in the Offspring of Epileptics,<sup>1</sup> it has been my privilege to have the aid of a social worker to check up the results of my previous work. The fact that in only 8 of the 138 matings, where one or both parents were epileptic, did the offspring develop epilepsy was indeed surprising. Yet, when the ancestors of this same group were studied with the same point in view, direct similar heredity there again were only eight cases, or 5.8%. But, as I explained in my previous article, the data I obtained were largely through correspondence and personal interviews with friends and relatives of the patients and, therefore, subject to many sources of error; and had they not diverged so widely from the only other similar research work, that of Ebbverla, I should have hardly considered them worthy of publication.

The following table will show at a glance what a marked difference results when I

	Frequency	Percentage	Frequency	Percentage
Ebbverla	139	6.2	71	5.1
Thom	138	6.8	79	5.8



That 273 offspring out of a total of 533, or over 51%, should have developed epilepsy, seemed more startling to me than my own figures of only 10 epileptics in my total of 553 offspring, or less than 2%.

My purpose has been to make a more intensive study of the cases already reviewed, to determine, if possible, to what extent epilepsy is transmitted directly from parent to offspring. The 33 cases I wish to report include 7 of the 8 matings where the resulting offspring were epileptic, and the total of 10 epileptic children include 8 of those reported in my last paper. In other words, the field worker uncovered two more cases of epilepsy in her more exacting study of these 33 cases than I did by my less accurate method. Of these 33 cases, 13 were male and 20 female. Thirteen cases, including 11 females and two males, had their epilepsy before marriage; 19 cases, 11 males and 8 females, had their first convulsions after marriage. The 33 matings resulted in 133 offspring, 86 of whom are living and 47 are dead. Of the total of 133 offspring, there is a history of convulsions in 10, five having died in infancy during seizures, two becoming arrested cases and three confirmed epileptics.

The causes of death in the cases of the deceased were as follows:

Infantile convulsions	5
Diphtheria	5
Tuberculosis	5
Indigestion	5
Malnutrition	2
Scarlet Fever	1
Purpura	1
Menigitis	1
Unknown	9
Unascertained	13

47

The present age of the surviving children is as follows:

Under 1 year	1
Between 1 and 5 years	10
" 5 " 10 "	14
" 10 " 15 "	10
" 15 " 20 "	11
Over 20 years	40

86

This group of living offspring whose parents, one or both, were epileptic contains 46 cases still under 20 years of age, and in the epileptic zone. What per cent. of these cases will develop epilepsy no one can say at this time, but it is not probable that it will be 50%. Of the cases over 20 years of age, heredity will play a much less important part. So it appears that the results of the earlier work have been to a large degree substantiated by this more intensive study, and that the conclusion that epilepsy is less often transmitted directly from parent to offspring than we have heretofore been led to believe is justified.

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## ARTIFICIAL HELIOTHERAPY: THE MERCURY-VAPOR-QUARTZ LIGHT A VALUABLE THERAPEUTIC AGENT.

By JOHN BRYANT, M.D., BOSTON.

Is sunlight or is heliotherapy of real value in medicine? This question has been pretty conclusively answered in the affirmative. It appears that the live agent or active principle in producing the good results is the action of the blue rays in producing a pigmentation of the skin, the pigment then in some manner becoming a circulating metabolic rectifier; thus in Switzerland it has been noted that tubercular patients recovered, and that their prognosis varied with the rapidity and ease of pigmentation of their skins.

If blue light is the active agent, it follows that any method which delivers blue light to the skin is a valuable substitute for heliotherapy, the more so as any electrical method is always available, whereas the sun, at most, is available only at certain hours, even when not obscured by smoke, fog, or clouds.

It is known that the mercury-vapor are generates plenty of short-length actinic rays. It is also known that quartz is a substance, and one of the very few, not opaque to the blue rays. It is, therefore, theoretically possible to produce a light which will deliver at the skin blue light not associated with excessive heat. At least one such lamp has been for some time available.

To produce pigmentation is to reproduce the effect and to promise the results of which actual sunlight is capable. The only question remaining, therefore, before being forced to admit the value of such a lamp, is whether it really does produce in action a rapid pigmentation of the skin exposed to its rays.

One of the lamps in question has been in use in my office since mid-August. Employed in connection with graduated heat from incandescent carbon filaments, as a metabolic stimulant for asthenic chronic intestinal cases, it has been clearly demonstrated that the light of this lamp actually does produce very rapidly a redness, even to blistering and peeling of the skin, and soon results in the acquisition of a pigmentation of the skin not to be distinguished from that obtained by much longer exposure to actual sunlight.

The lamp is, in fact, so active that a five-minute exposure at a distance of a metre or so may result in a sensitive skin turning, as one patient expressed it, "as red as a lobster," by the end of twenty-four hours.

Since many patients will find it not only more convenient, but actually a saving of time, to have their skins tanned by artificial heliotherapy, in a quiet room, regardless of the time of day or night, and since it is proved that the lamp does produce the all-important pigmenta-



tion, it is suggested that the use of such an apparatus might to great advantage become more general, not only in private practice, but in hospital circles. Used rightly, such a lamp is certainly a powerful and valuable addition to therapeutic resources, as an easily available and ever ready substitute for actual heliotherapy. Its indications would seem to be those of sunlight itself.

## Therapeutic and Preventive Medicine.

### THE TREATMENT OF OBESITY BY A RATIONAL DIET.

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In the treatment of obesity, the object aimed at is the combustion of a definite amount of surplus fat in the body, and the prevention of its reaccumulation. Regulation of the diet constitutes the essential part of this treatment.

It would be an easy matter to calculate the formula for reducing the fuel value of the food intake, if oxidation in the body were always regular and uniform. In such case the amount of reduction would have a caloric value, equal to that of the quantity of body fat which it is desired to burn up. For example, if the reduction in weight desired is at the rate of two pounds a week, which means the combustion daily of about four and a half ounces of body fat, the fuel value of the daily ration would have to be reduced about 1000 calories below the normal for size, age and activity. But the oxidation of fat in the body is not always regular and uniform, and does not always respond promptly and fully to the demands made on it by partial starvation. Extensive variation of this oxidation in different individuals is a matter of common observation: frequently small eaters are seen to remain persistently stout, while large eaters are persistently remain thin. Nevertheless, the formula suggested serves as a basis on which to work out the best formula for the individual case.

Measures to improve oxidation in the body are called for in the treatment of obesity; and as all metabolic processes are more or less under control of the internal secretions, such measures are directed very properly toward improving the condition or action of the glands which produce those secretions. This means, as regards diet, regulation of the quality as well as quantity of the food, so as to diminish, in particular, the toxemias of alimentary origin which could injure those glands or disturb their functions. This is effected mainly by restriction or exclu-

sion of articles of food of animal origin excepting milk and its products.

The following practical suggestions for regulating the diet in obesity seem in harmony with the facts and principles above alluded to.

Bear in mind that regulation of the diet is the principal thing in the treatment of obesity, and that this regulation should be qualitative as well as quantitative.

Insist on scales and measures being used to secure accuracy in carrying out the dietetic prescriptions.

Do not rely for protein chiefly on animal tissues and eggs, as is done in most obesity diets, but secure protein chiefly from milk and its products, which supply all the different amino acids needed by the body and are relatively easy of metabolism, being free from purins and comparatively insusceptible to putrefactive processes in the alimentary canal. If no other morbid condition is obviously present, a small amount of animal tissues or eggs may be included in the diet; but in cases complicated by obvious insufficiency of nitrogenous metabolism (as shown by gout, gravel, migraine, arteriosclerosis, chronic nephritis or hepatic insufficiency), or by disease of the alimentary canal, which increases the habitual production in that canal of putrefactive poisons and their absorption therefrom, the amount of flesh and eggs should be very small indeed or they should be excluded altogether. Such qualitative regulation of the protein ration for the special purpose of easing the burden of nitrogenous metabolism, is a cardinal principle in this method of treating obesity and its distinguishing feature.

Include plenty of fresh fruits and vegetables in the diet, in order to supply full rations of the body salts and vitamins; but use careful selection so as to include only fruits and vegetables which are comparatively free from objectionable qualities, such as indigestibility, possession of purin or oxalic acid content, and offensiveness to the patient's idiosyncrasies.

Allow water to be drunk in ordinary quantities.

Begin the treatment by restricting the fuel ration so as to supply about 1000 calories less than the minimum health ration for the particular patient.

Do not reduce the quantity of protein much below the minimum health ration, but let the loss fall chiefly on the fat and carbohydrate.

Do not, as a rule, try to reduce the weight by more than two pounds a week, on the average. Such a moderate reduction is not often attended with any unpleasant consequences.

Bear in mind the exceptions which exist in regard to reducing weight: be cautious in reducing the weight of those afflicted with serious diseases; relax the rigidity of the diet or discontinue all attempts at reduction, if in the course of treatment symptoms of distress or weakness



appear (which does not often happen with this plan of treatment); and do not, as a rule, attempt to reduce the weight of those entering on old age who have been obese for a considerable time.

In most cases allow occasional periods of rest from the rigid diet, and while giving the minimum health rations, take note if the weight increases in consequence.

A series of dietetic prescriptions for obesity, devised by the writer in accordance with the above suggestions, have the food values shown in the index table given below. These prescriptions readily lend themselves to modifications for individual needs. The numbers in the main column of protein values refer to protein derived from milk, cereals, fruits and vegetables; and the numbers after the plus signs in the same column refer to protein derived from animal tissues and eggs. It will be seen that the protein derived from the latter sources is greatly restricted in this plan of treatment.

INDEX OF OBESITY DIETS.

Prescription Number	Protein grams	Fat grams	Carbohydrate grams	Calories
I	50	32	112	975
II	50+4	36	113	1000
III	50+14	41	113	1100
IV	58	40	125	1125
V	58+4	42	125	1150
VI	60	44	136	1250
VII	62+14	48	125	1275
VIII	65+14	52	140	1375
IX	76	51	170	1400
X	76+14	58	170	1525

### Clinical Department.

#### THE STREPTOCOCCUS MUCOSUS CAPSULATUS AS A CAUSE OF MASTOID DISEASE.\*

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ACCORDING to my experience the streptococcus mucosus capsulatus is the most insidious and destructive germ with which the otologist has to contend, and the question of an operation, when the mastoid cells are involved, is a most important one.

In 1905 Dr. George Sloan Dixon published in the *Archives of Otolaryngology*, Vol. xxiv, Part 6, a paper entitled "Report of a Case of Panotitis Resulting in Meningitis, with Pathological Findings," in which he reported the case of a nurse who was under my care in the New York Eye and Ear Infirmary. She entered the hospital on February 7, 1904, and gave a history of an acute

attack of otitis media which had begun six weeks previously. She had labyrinthine symptoms which, with the knowledge we have today, would have warranted an operation. There was no mastoid tenderness. On the fourth day after admission meningitis developed, and she died almost immediately.

In this paper Dixon says: "This case seemed to call for an examination of my bacteriological examinations during the past four years. They were found to comprise about 1050 cases of acute and chronic purulent otitis, with and without mastoiditis; 2.75% of the infections were Friedlander's pneumococcus, or, more properly, the bacillus mucosus capsulatus." Of 30 cases due to the bacillus mucosus capsulatus, 15 had existed for 42 days or over, before operation. Of these, two had perisinous abscesses with Bezold perforation; one had perisinous abscesses and cortical perforation with subperiosteal abscess; four had epidural abscess (one of which died of meningitis); one had panotitis and died of meningitis; and one had brain abscess and also died. Six cases had periosteal abscesses.

Dixon further says: "Of those cases which had existed under 42 days, four promptly recovered after paracentesis, but mastoid operation was required on the remaining ten, and all did well except one patient who died of pneumonia."

Such a report only emphasizes the virulence of this germ, and since that time I have taken particular pains to watch these cases most carefully, especially with reference to an early operation.

During the years 1914-1915, I had the four following cases in private practice:

CASE 1 was that of Caroline R., aged 5, who was seen by me in consultation on May 12th. She had had lobar pneumonia one month before when both ears had been affected, and there had also been an acute inflammation of the throat and enlarged glands in the neck. The right ear had cleared up, but the left had been discharging for about three weeks. The left membrane had ruptured spontaneously two weeks before I saw her. There was slight tenderness over the mastoid tip, the temperature had been rising, a little higher each day, from 99.2° in the morning to 101 or 102 in the afternoon, and a culture showed that the streptococcus mucosus capsulatus was the cause of the infection. A simple mastoid operation was performed that same day at the Infirmary. As soon as the tip was opened pus poured out. There was a very large cavity and the whole mastoid cells were involved; softened bone and granulations were everywhere. The wound was dressed in the usual way and the child made an uneventful recovery. Her temperature was 99° before the operation.

CASE 2 was that of S. L. P., aged 64, who came to me on April 15th, complaining of pain in the right ear, and giving a history of a feeling of fullness in that ear three days ago. Examination showed the membrane slightly red and swollen about the short process as well as the canal. There was also slight tenderness on pressure over the mastoid. He was given drops to use, but as the pain was not relieved,

\* Read at the annual meeting of the American Otological Society held in Washington, D. C., May, 1916.



I opened the drum membrane under gas that same evening. Some serous fluid and gas escaped. He was then directed to douche the ear frequently during the day. The pain seemed to yield to treatment, and he was apparently doing well until three days later when the ear stopped discharging and began to pain again. The patient felt very dizzy and almost fainted on attempting to rise on the morning of April 19th, and that afternoon the drum membrane was again incised under gas. On the 20th the ear was discharging freely and there was practically no dizziness. An x-ray picture showed cloudiness of the mastoid cells on the right side, and a culture showed the cause of the infection to be the streptococcus mucosus capsulatus.

The ear discharged very freely until April 22d, when the perforation closed. On the 24th the patient felt very much better after the best night he had had for a long time, and the drum membrane seemed to be clearing. On the 26th of April it became necessary to open the drum for the third time. On the 29th there had been but a slight discharge, and the patient seemed to be in about the same condition as he was ten days before. A second x-ray plate showed a slight increase of cloudiness on the affected side.

A consultation with Dr. Lewis and Dr. Townsend was held, and Dr. Lewis and I strongly advised operation, which was done at the New York Eye and Ear Infirmary on April 30th. The usual incision was made. The bone of the outer cortex was extremely hard and very thick. The large tip cell was filled with pus and granulations, and the rest of the mastoid contained granulations and softened bone and some pus. The antrum was large. Everything was cleaned out and the wound packed with sterile gauze. The patient left the hospital in a little less than two weeks, and his recovery was steady though a little slow. The wound was dressed in the usual way, and gradually filled up. By June 11th there was one spot of bone still uncovered near the tip and there was a small sinus at the tip leading into the soft tissues. That morning the patient came into my office with marked swelling, extending down into the neck, which had come on suddenly the night before. This seemed to be caused by about a half teaspoonful of pus which I squeezed out of the same sinus, and by the next day the swelling had practically subsided except around the tip.

The patient went away for the summer and was under the care of a local physician. He had been very much run down, and this was undoubtedly the cause of the slow healing of the wound. The change of air to the country greatly improved his general health, and on his return to the city the wound was entirely healed and had been so for about a month.

CASE 3 was that of J. W. A., who has been a patient of mine for a number of years, suffering from a chronic middle-ear catarrh on both sides, and exostoses in each auditory canal. On December 20th I was called to see him by his family physician, as he had a severe cold and pain in the right ear. On examination I found some vesicles filled with blood in the canal, which prevented a good view of the drum membrane. He was directed to syringe the ear every two hours with a solution of boric acid. The next afternoon, as the temperature suddenly went to 101° after being normal in the morning, and as there was some tenderness over the lower

third of the mastoid bone, especially at the tip, I incised the drum under gas. After the incision the temperature was normal, but the discharge became more profuse and purulent and the tenderness over the mastoid was quite marked, especially over the tip. A culture was made and showed that the streptococcus mucosus capsulatus was the cause of the infection. A blood count showed the polys as high as 78%, and the leucocytes ranging from 5000 to 6000.

An operation was performed at the New York Eye and Ear Infirmary on December 25th. The usual incision was made. Pus was found under pressure in a large cell in the lower third of the mastoid. The outer cortex was very hard, especially over the antrum. A very large antrum was filled with soft bone and many granulations. The dura was uncovered to a very small extent in the middle fossa. The wound was packed with iodoform gauze in the upper part, over the dura, and with plain gauze in the lower part.

The patient left the hospital on January 5th, and the wound was dressed in the usual way. He was considerably prostrated by the infection which seemed to pull him down very much, and as a result the wound was slow in healing. By the first of March it was practically healed and the patient went South. He returned the first of April, greatly improved in his general health and with the wound in excellent condition. The hearing of the right ear is practically the same as that of the left, though that of both is somewhat impaired, owing to his old catarrhal trouble.

It is interesting to note, in connection with this case, that a urinalysis, made just before the operation, showed the presence of some albumin and a few casts evidently due to the poison, as an analysis made a month previously showed no abnormal conditions.

CASE 4 is that of Paul B., a medical student, who was seen by me in Roosevelt Hospital in 1914. He had an acute inflammation of the ear which was due to the presence of the streptococcus mucosus capsulatus. The ear had discharged spontaneously before I saw him, and there was slight tenderness over the mastoid bone. Five x-ray plates were taken of the mastoid bone. The first three plates were cloudy but the fourth showed a less cloudy appearance and the final one was so much cleared up that I decided not to operate, as the drumhead had resumed its normal appearance and all tenderness on pressure over the bone had disappeared.

The following cases are a few of those treated in my clinic at the New York Eye and Ear Infirmary during 1913, 1914 and 1915:

CASE 1. Barney G., a Russian, aged 53 years, came to the Infirmary on May 31, 1913, and gave the following history: Pain in the right ear began six weeks ago, following a cold. He suffered pain every night for over four weeks, and two weeks ago noticed a slight purulent discharge which has continued up to the present time. The drum membrane was incised in the clinic, and on the next day a post-auricular swelling appeared and gradually increased in size. Examination showed slight discharge from the right ear, the superior wall sagging, the drum membrane red and bulging, and a perforation in the lower part. There was tenderness on pressure over the mastoid area, especially over the



antrum. A culture was made and found to be the streptococcus mucosus capsulatus. An x-ray plate showed the left mastoid clear, with large pneumatic cells. The right seemed to be completely disorganized; two localities suggested perisinous and epidural abscesses,—the former below and the latter near the knee of the sinus. Three days after admission to the hospital a simple mastoid operation was performed and soft pneumatic cells were found with large perisinous and epidural abscesses. The tip was also removed. The temperature on admission was 99.2°; after the operation it rose to 101.6° but gradually came down to normal. The patient was discharged from the hospital on June 14th, and the subsequent dressings were done in the out-patient department.

CASE 2. Thomas D. Irish, aged 55 years, was admitted to the Infirmary on October 21, 1913. His illness began on August 15th, with a severe attack of pain in the left ear which continued until the drum ruptured, twenty-four hours later. Following that there was intermittent discharge and occasional attacks of pain, none of which was severe, and he was advised to come into the hospital because of the discharge and tenderness over the mastoid. A bacteriological examination showed the streptococcus mucosus capsulatus. The x-ray showed the right mastoid with moderate-sized cells of the pneumatic type; the cells were clear. The left mastoid seemed to be similar, but very cloudy. The sinus was far forward and looked as though it might be under the canal. A simple mastoid operation was done October 21st, revealing a large perisinous and epidural abscess, and a mass of dark necrotic granulations filling the antrum. The dura under the middle fossa was exposed and the sigmoid sinus for a considerable space. The temperature was 96.2° on admission, and immediately after the operation went to 101°, fluctuating between that point and 98° for four days until it became normal. The patient was discharged from the hospital on November 6th, and after that was dressed in the out-patient department.

CASE 3. Fred G., an American, aged 21, was admitted to the hospital July 25, 1913. He gave a history of pain and deafness in the right ear on July 7th, following sea bathing. The drum membrane ruptured and he came to the clinic the next day with a profuse discharge from the ear. He was admitted to the hospital for observation and the drum membrane was freely incised. There was slight sagging of the posterior wall and moderate pain. Examination of a smear showed strong suspicion of a streptococcus mucosus capsulatus, but Dr. Dixon could not be sure of it. The x-ray showed a moderate-sized pneumatic mastoid left, with extensive development of zygomatic cells, all of which were clear. The right side was cloudy throughout. The sinus seemed superficial and there were perisinous and epidural abscesses. The usual operation was performed on the right ear on July 31st. The bone was of the large pneumatic cell type filled with soft necrotic granulations. A large extent of dura was exposed, and the sinus was exposed and healthy. The tip and zygomatic cells were carefully cleaned out. The patient was discharged on August 8th, and treated afterward in the clinic.

CASE 4. Rose K., a Russian, aged 21, was admitted to the hospital on September 2, 1913, with a history of pain in the left ear five weeks before, fol-

lowing a cold. The drum had been incised one week before, and since then there had been a slight purulent discharge. Pain had been severe for the past few days with pain behind the auricle. Examination showed the left ear filled with thick pus. The drum membrane was bulging and perforated with sagging of the posterior superior wall, and there was slight tenderness on pressure over the mastoid antrum and tip. A bacteriological examination showed the cause of the infection to be the streptococcus mucosus capsulatus. The x-ray showed the right to be a moderate-sized clear pneumatic mastoid, with a number of zygomatic cells. The left was of the same type, but very cloudy throughout. Operation was advised, but refused, and the patient left the hospital on September 7th.

She came to the Infirmary again on September 13th, and on the 16th a simple mastoid operation was done on the left ear. The outer cortex was rather thick, and the bone was of the moderate-sized pneumatic type. There was no free pus. There were necrotic granulations and the bone was broken down. The zygomatic cells were cleared out and the tip was removed, and a small area of dura in the antrum and middle fossa was exposed. The patient was discharged on October 2, 1913, and treated afterwards in the clinic.

CASE 5. Adolph R., a Roumanian, aged 59, came to the Infirmary on June 3, 1913. His trouble began three months before, following exposure to cold. He had pain in the left ear for the first eight days and then had no further trouble, except an occasional rumbling noise, until two days before he came to the clinic, when the pain recommenced with a discharge. Examination showed a slight foul discharge from the canal, the membrane red and bulging, with slight sagging of the posterior and upper canal wall. There was no mastoid tenderness. The patient had diabetes. The bacteriological examination showed that the infection was due to the streptococcus mucosus capsulatus. A blood count showed the white cells, 7100, and the polys 61%. The x-ray showed the right mastoid to contain large pneumatic cells. The left was of the same type but cloudy throughout, disorganized below and behind, and probably an epidural abscess near the knee. There were high zygomatic cells. A simple mastoidectomy was done. There was very extensive destruction of the cells, pus in the antrum and tip, and both an epidural and a perisinous abscess found. The patient made a good recovery.

CASE 6. Jacob S., an American, aged 19, came to my clinic on November 19, 1912, with acute pain in the right ear of one week's standing. The membrane was red and bulging and was incised. The pain was relieved at once. There was little, if any, discharge. On December 30th, the patient noticed pain over the mastoid and the discharge increased in quantity. He came to the clinic again on January 5, 1913. Examination of the right ear showed a slight, thick discharge in the canal, which was constricted throughout and sagging in the posterior and upper portion. There was a small perforation in the drumhead, and slight tenderness over the mastoid antrum on firm pressure. The cause of the infection was the streptococcus mucosus capsulatus. An x-ray showed both mastoids to be of the large-celled pneumatic type, the right being hazy throughout, especially above and behind the antrum. The temperature was 98°. A simple mastoid operation



was performed and free pus was found in the antrum and tip. There was a perisinous abscess. The patient was discharged from the hospital on January 14th, and treated in the dispensary.

CASE 7. Christian S., a Greek, aged 30, came to the Infirmary on June 23, 1914, with a history of continuous and moderate discharge of one month's duration. He had had no severe pain. There was diffuse post-auricular tenderness and considerable sagging of the upper and posterior wall of the canal. The drum membrane was almost occluded. The bacteriological examination showed the streptococcus mucosus capsulatus. The x-ray examination showed a large clear-celled pneumatic mastoid on the right, and on the left the same type, but cloudy throughout. On operation an epidural abscess was found and a large area of dura was exposed. The sinus, covered with granulations, was also exposed. There was a very extensive and destructive process. The temperature was 99° on admission, and after the operation went to 100.3°. The patient was discharged on July 13th, and treated subsequently in the clinic.

CASE 8. Mary A., an Austrian, aged 36. Her illness began with severe pain in the left ear following a chill, four weeks before her admission to the hospital on September 8, 1914. The pain gradually increased in severity until the drum was opened. Her temperature on admission was 99.2°. The cause of the infection was the streptococcus mucosus capsulatus. Operation showed the diploetic type of bone. The entire process was extensively involved, and there was a perisinous abscess. There was no involvement of the posterior sinus cells. The tip was removed and a large area of dura was exposed. The patient left the hospital on September 17, 1914.

CASE 9. Max B., an Austrian, aged 32, was admitted to the Infirmary on May 18, 1915. He gave a history of pain in the left ear 10 days before. Two days after the pain began he came to the clinic and the drum was incised. Discharge continued until the day before his admission to the hospital when it ceased, and the pain began again. There was great tenderness on pressure over the tip, some constriction of the canal, and the drum membrane was swollen, reddened, congested and bulging. The bacteriological examination showed the presence of the streptococcus mucosus capsulatus. The x-ray plates showed a large mastoid, right, with extensive zygomatic cells. Cells were also present about the antrum. The left was a very large pneumatic mastoid, comparatively cloudy. The report from the laboratory characterized this as "probably an operative case." His temperature on admission was 101°. The operation revealed the cells filled with pus, and great destruction of the bone. The large tip cells were filled with pus under pressure. The sinus was covered with granulations forming a perisinous abscess. The patient left the hospital on May 28.

CASE 10. David D., a Scotchman, aged 68, came to the hospital on June 18, 1915. He first had pain in his left ear five weeks before. The drum was incised one week later and again three weeks after that. Two days after the last incision he developed severe pain in the ear and tenderness posterior to the auricle, and the discharge became more profuse. There was tip tenderness over the mastoid and a thick purulent discharge. A linear perfora-

tion was seen in the drum membrane. The laboratory reported the presence of the streptococcus mucosus capsulatus. The x-ray showed both mastoids of the pneumatic type with thick cortices. The right was fairly clear and the left quite cloudy. A simple mastoid operation was done on the left ear, and the mastoid cells were found filled with granulations and pus. The tip was completely removed. No sinus or dura was exposed. The temperature on admission was normal. The patient was discharged on June 30, and treated in the clinic.

CASE 11. Herbert F., an American, came to the clinic on March 4th, 1915, with a history of slight pain three weeks before. The ear had felt stopped up and deaf, and finally had ruptured spontaneously. Slight pressure over the tip caused pain. There was no sagging of the canal wall. The discharge was moderate. There was marked bulging of the drum membrane. A culture showed that the streptococcus mucosus capsulatus was the cause of the infection. The x-ray showed the right mastoid to be a moderate-sized clear pneumatic. The left was of the same type, but cloudy throughout. The usual mastoid operation was done. There was extensive involvement of the mastoid cells, which were filled with softened bone, granulations and thick pus. The temperature was 100 on admission.

From an analysis of these cases it will be seen that some patients complained of slight pain, and others of very severe pain, but that there was extensive destruction of the mastoid cells in all cases that came to operation, particularly in the hospital cases. There was both a perisinous and an epidural abscess in seven of the eleven hospital cases, and in two others the dura was exposed. In two of the private cases, also, the dura was exposed.

The x-ray is a most valuable aid in deciding upon the advisability of an operation. If a mastoid, which was previously shown to be cloudy, begins to clear up, and the symptoms show a steady improvement, I feel that we can afford to wait if the patient is carefully watched, and if a sufficient number of x-ray plates are taken. Such was the method pursued in the case of the patient who escaped operation. If, on the other hand, a patient is under treatment and the discharge persists while all tenderness on pressure over the bone has disappeared, it is more than likely that a destructive process is going on in the mastoid cells, and we are likely to find an exposed dura and sinus, particularly if the condition continues for from three to six weeks. A blood count is generally of little value.

In concluding, I desire to draw attention to the following points:

1. The patient may have very severe pain, or the pain may be slight, and the temperature is seldom much above normal.
2. Tenderness on pressure over the mastoid process may be well marked, or there may be none, especially where the outer cortex is thick.
3. The discharge in some cases is very profuse, while in others it is slight, and there may



or may not be sagging of the posterior and upper canal wall.

4. The x-ray is a most valuable aid, as the cells on the affected side will be cloudy, and in some instances it is possible to detect an epidural or perisinous abscess.

5. We should err on the safe side and operate when in doubt, for we often find a great destruction of bone, even in cases that present few symptoms. It is only in a few cases, which yield readily to treatment, that an operation can be avoided.

### A CASE OF DOUBLE EMPYEMA SUCCESSFULLY OPERATED UPON, WITH REMARKS UPON LOCALIZATION.

By F. B. LUND, M.D., and H. MORRISON, M.D., BOSTON.

This case of double empyema, is reported because of the rarity of double empyema,—at least of case reports thereof,—and because of the interest attached to the localization of the abscesses, which was quite different upon the two sides.

A girl of 16 was attacked on March 20, 1915, by epigastric pain, vomiting, headache, and slight cough. At Dr. Morrison's first visit her temperature was 102, pulse 120, and respiration 30. Examination showed signs of beginning consolidation at the base of the left lung. The following morning there were signs of frank consolidation of the left lower lobe.

From the very first, this patient looked very sick. On April 1st, her leucocyte count was only 5,000, showing her poor resistance. On April 2d,—the fourth day of the illness,—there was involvement of the right lower lobe; and by the end of the ninth day, the middle and lower lobes of the right lung and the lower lobe of the left were solid. The girl was obviously septic. Her leucocyte count had risen to 23,000. The temperature ranged from 100°-101° F., mornings, to 103°-104°, evenings. There was slight cyanosis, with considerable dyspnoea. The pulse was rapid; the systolic blood pressure was 115. Cardiac stimulation had been instituted early in the disease. There was considerable cough, and the sputum was muco-purulent and very tenacious.

The expected crisis failed to appear during the next six days. The patient was prostrated; she was running a septic temperature and was beginning to perspire freely. At both bases and the axillae there had developed flatness below the level of the angle of the scapula with distant bronchial breathing and bronchophony. Above this zone were fine crepitant rales. Both Dr. E. A. Locke, who was called in consultation, and Dr. Morrison felt convinced that there was fluid in the chest, probably pus, but they were uncertain whether it was in one side or the other, or both.

On April 14, the fifteenth day of her illness, she was sent to the Boston City Hospital, with the provisional diagnosis of double empyema. An x-ray examination at that time showed increased density in the left lower lobe, suggesting consolidation rather than fluid. Dr. Lund then did paracentesis in both sides of the chest, in two places

in each side, with no result. For the next three days the patient's condition remained unimproved. On April 18, she began to cough up a great deal of foul pus, without relief, however.

On April 21st the left chest was again tapped. This time a few drops of thick pus were obtained through the needle inserted in the ninth interspace in the posterior axillary line. Resection was done of an inch of the ninth rib, with the evacuation of several ounces of thick foul pus, similar to that which the patient was expectorating, found as a thin layer between the lung and the chest wall. Drainage was established through a rubber tube inserted obliquely, with the skin sutured over the end to act as a valve.

On the following morning the patient's condition had not improved, and the right pleural cavity was explored a second time. A needle inserted through the tenth interspace near the spine, and directed upward, obtained a few drops of pus. The tenth rib was resected near the vertebra, and a few ounces of foul pus were found between the right lung and the spine. Drainage was established through a rubber tube.

The patient began to improve at once. There was profuse drainage through both tubes. The cough and expectoration subsided gradually. The sputum never showed any elastic tissue fibres. The temperature reached the normal level by the middle of May, 1915. The pulse rate remained elevated for another month. By the end of May, both wounds were granulating, and there was very little discharge through the small sinuses. On May 29th, an x-ray examination showed no evidences of fluid in the chest; there was some haziness throughout both lungs, but they were well expanded.

Through the summer, the patient improved steadily. She gained in strength and weight. Cough and expectoration ceased entirely. Both lungs became clear and expanded well; the chest became symmetrical.

### COMMENT.

This is a case of double empyema following pneumonia. As judged from the series of cases of empyema collected by Dr. F. T. Lord<sup>1</sup>, one case in fifty is bilateral.

On April 18, 1915, when this patient began to raise fetid pus in large quantity, there was a perforation of the lung tissue. The pus expectorated and the pus evacuated surgically were identical. Osler<sup>2</sup> speaks of perforation into the lung as one of the natural modes of cure of empyema. He quotes from an article by Traube, published in 1872, entitled, "On a Natural Mode of Cure in Purulent Pleuritic Exudate." There appear two ways in which an empyema may discharge through the lung: first, by opening into a bronchus and the formation of a fistula; and secondly, by a local necrosis of the pulmonary pleura, exposure of the parenchyma, and a soakage of pus through the spongy lung tissue into the bronchi. In the first way, pneumothorax usually, though not often, develops, and aggravates the danger. In the second way, pus is usually discharged without the formation of pneumothorax, and must be regarded as one of the most favorable modes of termination in empyema. We believe that in the case here re-



ported, the perforation of the lung was of the second type, but the drainage so established by nature was insufficient to bring about a cure without surgical assistance.

It is worthy of note that the pus in the left pleural cavity was a thin layer between the lung and the chest wall, and in the right, between the lung and the spine.

The x-ray plates in this case, although there was a definite localized empyema on either side, showed merely a general haziness of the lower part of the chest. The position and outline of the cavity were not shown distinctly on either side. Percussion, also, failed to localize the cavities. It is easy to see why this was the case on the right side of the chest, where the cavity lay in an unusual position,—between the mesial surface of the lung and the spine and vertebral portions of the ribs. The neighborhood of the spine, vertebral muscles, and rib angles in this position make it very difficult to detect a thin, flat cavity. The cavity on the left, though superficially situated, was not large, and was so localized that a needle pointed in the usual direction, upward and inward from the ninth interspace and posterior axillary line, failed to strike it. Aspiration higher up also failed the first time it was tried.

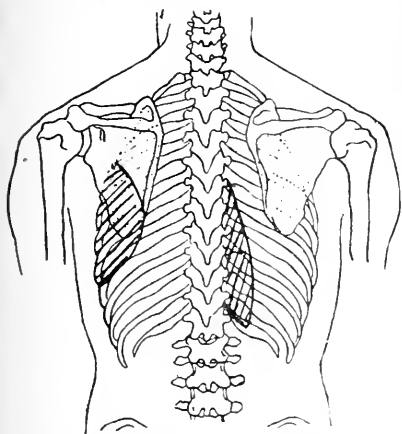


FIG. 1.—Showing position of pus cavities.

It is an interesting question, whether, when the history and physical signs strongly favor the presence of pus, but aspiration is negative, the chest should not be opened and a search under the guidance of the finger made. Granted that the needle is the right size and intelligently manipulated, aspiration may be negative. Being negative in this case, it was repeated on both sides in two places, although the chest was not opened until one week later. Repeated aspiration, however, may be dangerous. Alarming hemorrhage has followed such aspiration in the hands of one of the writers in two cases. In one

of these, the chest was opened and the pus found while the hemorrhage was going on, the tapping being negative as far as pus went. It is interesting that in this latter case, operation showed the pus in the same place as in the case reported, namely, between the inner surface of the lower lobe and the chest wall. The deeper the needle is pushed into the lung, the greater the danger of the serious hemorrhage which may result from wounding one of the large arteries near a bronchus. The oftener repeated the aspiration, the more danger of deep or careless work. It is so easy to miss a localized empyema or an abscess, that we believe when the physical signs and history are positive, one should open the chest and push about with one or two fingers. Pushing the lung from the chest wall cannot cause serious hemorrhage, and an empyema cavity always lies between the lung and the wall, except in the rare interlobar empyema which always in the writers' experience comes up near the surface of the lung.

A lesson from this case and the case mentioned which was complicated by hemorrhage, is never to be satisfied with a negative result till you have explored the space between the inner surface of the posterior lobe and the spine. The problems of localized empyema are more interesting and difficult than the so-called general empyema, which is found at the base of the lung behind, and in which there is no difficulty in finding the pus, as it lies just beneath the ribs at the point of election for tapping, namely, the ninth interspace in the posterior axillary line.

The x-ray has occasionally been of the greatest assistance, but, as stated above, was of no value in this case.

#### REFERENCES.

- <sup>1</sup> Frederick T. Lord: Diseases of the Bronchi, Lungs and Pleura, 1915, p. 529.
- <sup>2</sup> William Osler: New York Medical Record, Oct. 20, 1883.

## A CASE OF BLOODY TEARS.

By M. J. KONIKOW, M.D., BOSTON.

THE extraordinary rarity with which bloody tears are seen in general practice may possibly justify the report of the following case:

A. M., 50, painter. Has been in good health, except for the last few months during which he had several attacks of slight nosebleeds. One of such nosebleeds started a couple of hours before I saw him. Ordinary means previously employed by him and members of his family had proven unsuccessful, and the physician's aid was sought.

Blood was freely flowing from the right nostril. An anterior tamponade failed to stop it, merely directing the flow backward. A complete stoppage of the flow was obtained only by a combined tamponade, anterior and posterior.

A few minutes after I succeeded in stopping the nosebleed, large bloody tears began to run down



the cheek from the right eye. Pressure, however upon the right nasal duct stopped this flow.

Of course, the source of these "tears" came from the blood that was caught between both tamponades and was forced into the nasal duct. So, physiologically, these "tears" were not tears at all, but the product of the backflow through the nasal duct.

True sanguineous lachrymation, *i.e.*, bloody tears produced directly by the lacrymal gland, is an extremely rare occurrence, and it is doubtful if it ever exists.

The *Index Medicus* mentions a few authors only who have reported cases of sanguineous lachrymation. F. R. Cross<sup>1</sup> reported a case of a girl of 21 who for several years had been suffering from bloody tears coming occasionally from the left eye. By excluding any other source, this writer thought the lacrymal gland responsible for this phenomenon. Hasner<sup>2, 3</sup> reported two cases of bloody tears, one in a girl of 13 who was exhibiting this phenomenon during the two years preceding her first menstruation; the other in a healthy young butcher where the cause of the trouble was located in a lentil-sized polyp of the upper conjunctiva. S. W. Ochapowski<sup>4</sup> reported a case of bloody tears, the cause of which he placed in the general hysterical character of the patient. With R. Spelleers<sup>5</sup> and R. Cross,<sup>6</sup> who reported similar cases of bloody tears, the literature on this subject is almost exhausted.

That bloody tears are not met with frequently, my own case fully confirms. In my twenty-three years as general practitioner this was the first case I came across.

#### REFERENCES.

- <sup>1</sup> Cross, F. R.: Blood Stained Tears. Tr. Ophthalm. Soc. U.K. London, 1890-91, xi.
- <sup>2</sup> Hasner: Das Blutweinen. Allgem. Wien. Med. Zeitschrift, No. 51, 1850.
- <sup>3</sup> Hasner: *Ibid.*, No. 1, 1861.
- <sup>4</sup> Ochapowski, S. W.: A Case of Bloody Tears Due to an Hysterical, Functional Affection of the Eye. Russky Wratch, 1902, i.
- <sup>5</sup> Spelleers, R.: Over gekleurde tranen. Nederl. Tijdschr. v. Geneesk., Amsterdam, 1907, ii.
- <sup>6</sup> Cross, R.: A Case of Supposed Sanguineous Lachrymation. Lancet, London, 1891, i, 21.

### Society Report.

#### BOSTON SURGICAL SOCIETY (INCORPORATED).

##### TENTH MEETING.

A clinical meeting of the Society was held on Monday, February 7, 1916, at the Peter Bent Brigham Hospital, at 10 a. m.

Dr. Cushing demonstrated a series of interesting cases as follows:

1. Cerebellar tumor. (This case was operated upon later before the Society.) The patient showed loss of vision and choked disc. The fundus was demonstrated to the members of the Society by a new binocular ophthalmoscope.

2. Cerebellar tumor. Two weeks after operation; beginning to sit up for first time in six months.

3. Endothelioma, with Jacksonian epilepsy. A previous exploration in Chicago had failed to discover the tumor, which lay near to the vertex. Much subjective improvement after removal of the tumor.

4. Solid pituitary tumor with huge hernia of the brain, following decompression done at the Massachusetts General Hospital. Trans-sphenoidal operation done by Dr. Cushing disclosed an irremovable pituitary tumor.

5. Internal hydrocephalus. Decompression done in Chicago. Trans-sphenoidal operation by Dr. Cushing showed a dilated third ventricle with internal hydrocephalus.

6. Pituitary tumor with internal hydrocephalus. Similar to Case 5.

7. Ductless gland syndrome, probably pituitary. Male with feminine characteristics. Decompression with relief of long standing headache.

8. Headache of typical pituitary character. Coincident diabetes. Case under investigation.

9. Pituitary tumor. Female. Headache; blindness in one eye, and hemianopsia in the other. Under investigation.

10. Dislocation of the atlas. Traumatic. Six months' duration. There was some numbness of the hands. X-rays showed the lesion plainly. At operation reduction could not be accomplished, but the spinal canal was enlarged to relieve pressure. Marked improvement.

There was a lantern slide demonstration of specimens of brain tumors.

Following the demonstration Dr. Cushing operated on Case 1, cerebellar tumor; and Dr. John Homans operated on a case of gallstones and pancreatitis, with drainage of the gall-bladder and of an abscess in the region of the head of the pancreas.

The meeting then adjourned.

(Signed)

L. DAVIS,

Acting Secretary.

### Book Reviews.

*Progressive Medicine*. Edited by HOBART AMORY HARE, M.D., assisted by LEIGHTON F. APFLEMAN, M.D. Vol. xix, No. 3, September, 1916. Philadelphia and New York: Lea & Febiger, 1916.

This quarterly issue of a standard digest of advances, discoveries and improvements in medical and surgical sciences, contains reviews of diseases of the thorax, the skin, the nervous system, and obstetrics. The latter constitutes half the volume and is an elaborate summary of recent literature on the subject. The section on dermatology includes also recent experience with arseno-benzol and diarsenol in the treatment of syphilis, and is illustrated with a dozen excellent cuts. The section on the thorax includes diseases of the heart, lungs, blood vessels, blood and circulation. The volume is a valuable collection of important recent contributions to the literature on the subjects in question.



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126 Massachusetts Ave., Corner Boylston St., Boston, Massachusetts.

## TWO IMPORTANT LEGAL DECISIONS.

In the weekly report of the United States Public Health Service for September 29, 1916, is recorded a recent important decision by the Michigan Supreme Court, relative to administration of the Workmen's Compensation Act. In the case of a workman injured by a sawmill accident, the employer refused to make compensation payments longer than nineteen weeks, on the ground that the employee's protracted disability was due to retardation of healing by preëxisting syphilis. The claimant denied that he had ever had this disease, and the Industrial Accident Board, adjudicating the matter, found that there was no suggestion of active disease in the applicant, prior to the injury. The diagnosis of syphilis was based on an unsworn laboratory report, whose validity was evidently called in question. The Board made no definite decision whether the period of the claimant's disability was or was not extended by the pres-

ence and action of the disease, but declined to relieve the respondent for the following reasons, as stated in the written opinion of its council.

"The legal question presented by the petition is an important one. If the correct rule for determining the length of time compensation for disability should be paid in case of an injury of this general character is found to be the one contended for by respondents, the result will be far-reaching. The question then to be determined in cases of continuing disability would be whether the injury should have healed, or whether it should have healed more quickly than it did, instead of the actual resulting disability. Instead of the plain question of fact as to the nature and duration of the disability which the injured man actually suffered, it would present for decision the question as to how much he should have suffered, and how soon he should have recovered, upon the theory that only a part of the disability was due to the injury, and the remaining part due to disease. In the opinion of the Board, the respondents' contention must fail. The compensation law does not fix any standard of physical health, nor does it make any exceptions for cases of injuries to men whose health is impaired or below the normal standard. Neither does it except from the benefits of the law the man who carries in his body a latent disease which, in case of injury, may retard or prevent recovery. The law by its expressed terms applies to every man who suffers disability from injury. It does not exclude the weak nor the less fortunate physically, but was intended for the workingmen of the State generally, taken as they are."

In awarding its opinion on this case, the Supreme Court commented in part as follows:

"We agree with the Industrial Accident Board that under the circumstances of this case the act does not contemplate any such apportionment of the period of disability as respondents ask for. Assuming that such disability is being prolonged by the disease, there is yet no point at which the consequences of the injury cease to operate. It is the theory of respondents, not that the consequences of the injury cease, but that they are prolonged and extended. There is no part of the period of disability that would have happened, or would have continued, except for the injury. The consequences of the injury extend through the entire period, and so long as the incapacity of the employee for work results from the injury, it comes within the statute, even when prolonged by preëxisting disease."

"The order of the Industrial Accident Board is affirmed."

On October 3 the Court of Appeals of Albany, N. Y., handed down a decision permitting the practice of healing by Christian Science without



a license, holding that, while the practice of healing by Christian Scientists would come within the legal definition of medical practice, the statute specifically exempts those who, in the treatment of bodily ills, pursue the tenets of any religion. This decision was awarded in the case of a Christian Scientist practitioner convicted in New York in 1912 and fined \$100 for practicing medicine illegally. This conviction was reversed by the Court of Appeals and a new trial ordered. The case was a test action instituted by the New York County Medical Society in 1911. In his opinion, reversing the previous decision, Justice Chase comments in part as follows:

"Practicing medicine, when unaccompanied by acts that are in themselves evil, vicious and criminal, is not a crime at common law, but only becomes illegal when a statute is violated. The Legislature, in enacting the law requiring medical practitioners to be licensed, wrote in an exception which applies to Christian Scientists, and which reads:

"This article shall not be construed to affect . . . the practice of religious tenets of any church. . ."

"It was conceded at the trial, according to the decision, that Christian Science is a religion based on the scriptures.

"The purpose of the general statute is to protect citizens and others of the state from being treated in their physical ailments and diseases by persons who have not had adequate or proper training, education or qualifications to treat them.

"The tenets of a church are the beliefs, doctrines and creeds of the church. The exception relates to the tenets of the church as an organized body as distinguished from an individual. It does not relate to, or except, persons practicing in accordance with individual belief.

"It appears from the record that it is a tenet of the Christian Science Church that prayer to God will result in complete cure of particular diseases in a prescribed individual case. Healing would seem to be not only the prominent work of the church and its members, but the one distinctive belief around which the church organization is founded and sustained.

"We think the exception in the statute in this state is broad enough to permit offering prayer for the healing of disease in accordance with the recognized tenets of the Christian Science Church. . .

"A person should not be allowed to assume to practice the tenets of the Christian Science or any church as a shield to cover a business undertaking. When a person claims to be practicing the religious tenets of any church, particularly where compensation is taken therefor, and

the practice is apart from a church edifice or the sanctity of the home of the applicant, the question whether such person is within the exception should be left to a jury as a question of fact."

This judicial opinion, written by Justice Chase, was concurred in by all of the five judges sitting with him, except Justice Collin, who dissented. Chief Justice Bartlett, in handing down the decision, added a memorandum in which he said, "I would go farther. I deny the power of the Legislature to make it a crime to treat disease by prayer." The judgment of the primary court was, therefore, reversed and a new trial ordered.

In commenting upon this decision, the Weekly Bulletin of the New York Health Department for October 7 refers to it as one "of grave concern to all who are interested. . . in protecting unsophisticated laymen from unqualified pretenders to the healing art."

"While the medical profession is engaged in increasing the requirements demanded of all who wish to begin the study of medicine, and in raising the standards of medical colleges and the exaction of qualifying examinations, in order to secure better service to the public, there are some among the laity who are unwilling to see the practice of the healing art advance beyond the standards of superstition, where the laying on of hands, the use of amulets, charms, signs and magic phrases are relied upon to destroy the parasites of infectious disease in the sick and to frighten them from the well. Are such as who refuse to recognize that a typhoid infection, a smallpox eruption, or even a broken leg is anything more than a state of mind, to be allowed to pass in this state as qualified under the law to attend the sick?

"May any scamp who wishes to turn healer for 'easy money,' claim immunity from the law by pretending that he has a divine mission to heal, that his practice is part of a religion, which he may easily invent to cloak his purpose?

"Instead of four years at high school, a year or two at a general college and a four-year medical course, followed by an exacting state examination, and perhaps by a year's service in a hospital, may one take thought over night and hang out his shingle in the morning as a Christian Scientist, or as anything said to be a religion?

"If this is to be so, and we are loath to believe it, it will be much harder upon the public, the lambs who will be exposed to the wolves, than upon the shepherd dogs (the qualified physicians) who endeavor faithfully to guard the flock!"



## PROGRESS OF POLIOMYELITIS.

DURING the past week the poliomyelitis epidemic has continued practically unabated in Massachusetts, though declining elsewhere throughout the United States and practically at an end in New York. On October 17 the number of cases in New York City reached a total of 9217 with 2373 deaths. In New York State outside of New York City, there had been, on October 1, 2388 cases. On the same date there had been 3877 cases in New Jersey, 1561 in Pennsylvania, 773 in Connecticut, 718 in Minnesota and 672 in Illinois. It is estimated by the United States Public Health Service that there have been 28,262 cases since July 1 in the United States.

In Massachusetts, on October 21, the number of cases during this month reached a total of 518, making 1533 since January 1. Since October 1, the disease has extended into twenty-two towns of this Commonwealth, where no cases had occurred during the preceding ten months. These newly infected towns are Andover, Athol, Belchertown, Deerfield, Easton, Egremont, Grafton, Halifax, Hatfield, Hollbrook, Hopkinton, Longfellow, Manchester, Mashpee, Northboro, Northbridge, Walpole, Wenham, Westwood, Whately, Wilbraham and Wilmington. The largest number of cases has been 380 in Boston, 14 in Holyoke and 51 in Quincy. There have been 38 cases in Malden.

The New York Health Commission has recently published interesting data of the epidemic in New York City, with the following comment on the social status of the patients and on details of the administrative control of the disease.

"It is interesting to record that up to September 30 a total of 16,267 cases of supposed poliomyelitis were reported to the Department of Health by physicians, nurses, and members of various households. Of these, up to September 30, 8630 were proved to be true cases.

"Attention is called to the close approximation of the case fatality in the Department of Health hospitals and the case fatality in the twenty-seven other hospitals which admitted cases during epidemic, the difference being only one hundredths of one per cent.

"From August 21 to October 18 there were discharged from the hospitals of the Department of Health 2053 cases. Of these, 66% showed evidences of paralysis of some degree; 18% showed that paralysis had wholly disappeared;

15% had not shown paralysis at any time in the course of the disease.

"Of 2715 cases, followed up carefully in the homes, it has been found that 1885 have a serious paralysis of one or both lower limbs and are unable to walk; 530 more were partly paralyzed in the lower limbs, although still able to walk; 273 had one or both arms totally paralyzed.

"Judging from the cases already visited by the agents of the relief societies operating under the control of the Committee on After-Care, it is found that between 75 and 80% of the cases with a persistent paralysis will fall in the class of people usually obtaining medical services free through dispensaries or hospitals."

During the past fortnight, further reports of discoveries regarding the disease have appeared in the daily press. Dr. Edward C. Rosenow, of the Mayo Foundation at Rochester, Minn., is reported to have expressed at a recent meeting of the New York Academy of Medicine his opinion that the tonsil is probably an important point of entry for the infection. Experiments in the pathological department of the Johns Hopkins Hospital in Baltimore, by Dr. Montrose T. Burrows, would seem to indicate that the disease may make its entrance by the intestinal tract through the medium of infected food. No final decision on any of these theories can, of course, be made without further official report and study. At the dinner of the Massachusetts General Hospital House Pupils' Alumni Association, referred to in a later editorial in this issue, Dr. Haven Emerson, health commissioner of New York, in his informal remarks, indicated his belief that none of the present theories advanced to account for the transmission of poliomyelitis would prove, or expresses, the entire truth. He narrated various significant epidemiologic facts observed during the current summer in New York with regard to the disease and expressed the belief that no single therapeutic method had proved of as great value as the simple withdrawal of cerebrospinal fluid by lumbar puncture. This diagnostic procedure has proved, not merely to relieve symptoms, but apparently definitely to mitigate the course of the disease. An extensive report based upon the experience of the entire epidemic will, of course, later be issued.

As leading article in the present issue of the JOURNAL we are glad to publish the text of the address recently delivered by Dr. Allan J. McLaughlin, Massachusetts Commissioner of Health, at a joint meeting of the Massachusetts



Homeopathic Medical Society and the Suffolk District of the Massachusetts Medical Society. Dr. McLaughlin expresses similar skepticism about all advanced theories of transmission of the disease. The attention of readers is particularly directed to his illuminating and comprehensive description of epidemic poliomyelitis and his analysis of the present epidemic in Massachusetts.

On October 19 the Massachusetts Association of Boards of Health held its quarterly meeting on Mt. Tom at Holyoke, Mass. The principal address was by Dr. Charles F. Bolduan, director of the Bureau of Public Education of the New York Health Department, on "What Has Been Learned from the New York Epidemic of Anterior Poliomyelitis." There were other addresses by Dr. Gardner T. Swarts of Providence, R. I., secretary of the Rhode Island State Board of Health, on "Quarantine Hysteria," and by Dr. J. F. Winchester of Lawrence, Mass., president of the American Veterinary Association, on "The Tuberculous Milch Cow."

In the issue of the JOURNAL for September 14 we noted editorially the first death of a physician from poliomyelitis during the present epidemic,—that of Dr. Earl C. Peck of Newton, Mass., on September 5. The second death of a physician from the disease was that of Dr. Arthur L. Hunt, health inspector of the District of Columbia, who died of poliomyelitis on October 8. His obituary notice is published in another column of this issue of the JOURNAL.



## THE STERILIZATION OF CRIMINALS.

A REPORT appearing in the September number of the *Journal of Criminal Law and Criminology* reminds us that the question of the right of the Commonwealth to deprive one of its citizens of the power to procreate is still unsettled, although the general legal opinion is that, in the case of the criminal at least, it has no such right. Recent years have seen a movement in favor of the more humane treatment of prisoners, a scientific approach to the study of criminology, but our knowledge of the etiology of crime is still in too nebulous a state to render wise legislative approval of sterilization of criminals in order that more criminals may not be bred.

If we are going to deprive of his power of procreation, say some, those who have been twice convicted of acts which constitute legal felonies—breaking an electric light bulb, obstructing a highway or cutting a strap in a harness (Iowa code)—we might just as well write above the doors of our penal institutions: *Lasciate ogni speranza, voi ch' entrate*.

The first sterilization law was passed in Indiana in the spring of 1907. Since that time twelve other states have passed such laws, but in two of them (Iowa and New Jersey) they have been found unconstitutional. In four other states bills have been passed and vetoed. In seven other states bills were introduced and defeated in the legislature. It would take entirely too much space to give the history of these measures in the various states. Suffice it to say that so much doubt has arisen as to the constitutionality of such a law as applied to criminals that it is nowhere enforced, with the exception noted above. A test case was brought in Iowa in 1914 (Davis vs. Barry *et al.*, No. 9-A Equity.) In his opinion, which was concurred in by the other judges then sitting, Judge MacPherson said: "(This) operation is to destroy the power of procreation. It is, of course, to follow the man through the rest of his life. The physical suffering may not be so great, but that is not the only test of cruel punishment; the humiliation, the degradation, the mental suffering, are always present and known by all the public, and will follow him wherever he may go. This belongs to the Dark Ages. . . And our conclusion is that the infliction of this penalty is in violation of the constitution, which provides that cruel and unusual punishment shall not be inflicted."

It is the opinion of those best informed in the matter that the question of sterilization was entered into rather too hurriedly, before in fact it was definitely known just what part heredity played in the propagation of criminals. An example of this tendency to rush in was furnished by the American Medico-Psychological Association, at its annual meeting in Baltimore in 1914, when it nearly gave the seal of its official approval to a resolution approving of marriage laws—indeed, would have done so had not an objection been registered by a few of the wiser heads.

At present the following states have laws dealing with the sterilization of undesirables: California, Connecticut, Indiana, Iowa, Kansas,



Michigan, Nebraska, Nevada, New Jersey, New York, North Dakota, Washington and Wisconsin. In Washington, Nevada,\* New Jersey, New York, Michigan and Kansas no operations have been performed. In Indiana, the first state to pass laws of this kind, no operations have been performed since 1908. Wisconsin has sterilized 24 feeble-minded, Connecticut 21 insane, and California 634 insane. The American Institute of Criminal Law and Criminology appointed a committee on the sterilization of criminals in 1914, which has made several reports on the subject. In their latest one† it reports that, as far as it has been able to ascertain, no attempt is being made to enforce any of the laws providing for the sterilization of criminals except in Washington, where the law is punitive. It further states that the law is carefully administered in the states where operations are being performed.

One aspect of the question which has not seemed to attract so much attention is that of the attitude of the sterilized criminal to society. Aside from the fact that he may cherish a deep-seated grudge against the powers that be, may he not be potent for evil in other ways? Let us assume that vasectomy is all that is claimed for it, that it will prevent procreation but will not interfere with sexual intercourse; will not the knowledge that he is immune from the possibility of having to assume the responsibility of paternity render him a dangerous influence in the community? Too often the fear motive is dominant in the lower-class girl, and does more to restrain her from sexual immorality than any ethical consideration. This fear, too, is not that of contracting disease—for she is often unacquainted with the method of transmission of venereal disease, and if she is informed is too ready to believe that her lover is not infected—but the fear of becoming pregnant. The discharged criminal thus finds the bars down and becomes an influence for the lowering of morals in his circle, and often a distributing center for disease.

#### THE MENTAL EXAMINATION OF CRIMINALS.

It is generally known among medical men that a large proportion of the floating popula-

tion of jails and workhouses are mentally defective. The vagabonds, prostitutes, the chronic alcoholics, the petty criminals of all kinds, if carefully put through mental examinations, would undoubtedly show many cases of aborted precoc, imbecility, constitutional inferiority and constitutional psychopathy. Some observers believe that as many as 60% of all petty criminals are abnormal mentally.

Although we are still a long way from recognizing a class of persons only partly responsible for their actions, the *demi-fous* as the French call them, we are beginning to deal with the problem of investigating the mentality of those convicted of crime. Dr. Healy's work at the Juvenile Psychopathic Institute in Chicago is well known, and there has recently been established at Sing Sing Prison a department of the Rockefeller Foundation to make psychiatric investigation of the population. Court and police officials in many cities are beginning to appeal to alienists in doubtful cases before taking punitive action. Finally, the literature is becoming filled with material dealing with the subject.

In the *Journal of Criminal Law and Criminology* for September, there are two papers bearing on this subject. Dr. Yerkes, who will be remembered at once in connection with the Yerkes-Bridges-Hardwick tests, makes a few remarks on the mental examination of police court cases. He believes that we are only just beginning to progress in this line, that each human being is a tremendously complex individual problem, and that no psychological norm has yet been established. He says that first of all, these cases must be superficially divided into several classes: 1, normal persons, the victims of circumstances; 2, psychopathic personalities; 3, mental defectives; 4, drug addicts; 5, physical wrecks. Other classes may also present themselves. Obviously, some of these classes are not suitable for psychological observation, Classes 1 and 5 especially. Members of Class 2 should be transferred to asylums and studied there. Yerkes urges that each case should be investigated entirely by a single person, who, besides making a complete mental examination, should go into heredity, the personal history and the social conditions which have formed the environment of the patient. He especially protests against the practice of appointing inadequately trained persons to positions as psychological examiners. "If our police system,

\* According to the best information available.

† Case pending before the courts, March, 1915.

‡ Sterilization of Criminals. Report of "Committee F" of the Institute. *Journal of Criminal Law and Criminology*, September, 1916.



courts, and penal institutions are to utilize the methods of psychology at all, it should be through the service of adequately trained professional psychologists.'

In the same periodical Dr. Guy G. Fernald writes on the mental examination of reformatory prisoners; his paper is largely constructive in character. In the Massachusetts Reformatory the inmates are not examined until they have been some time resident, in fact, the psychonological interview is timed for the latter end of the period of incarceration, when the early feelings of resentment or homesickness or rebellion or braggadocio, as the case may be, have passed. The method of applying uniform tests has been abandoned for several reasons: It was too time-consuming; some tests were not adaptable to all subjects; it did not reveal character defects and personality asymmetries; it was too inelastic and formal, and word of the tests was frequently passed around to such an extent that results were vitiated. The line of demarcation between the normal and subnormal, found by various observers among different criminological groups to fall somewhere between 25 and 89%, is in this Reformatory 58%. Of this subnormal group, Fernald says it is important to separate out those who are incapable of honest self-support without surveillance,—what he calls the "segregation group." These show readiness to falsify and striking egotism.

The constructive part of the examination is the last part, where the patient's intentions for the future are ascertained. He may be required, for example, to write out his own plan of living for the next five years, to make up for his past mistakes. His emotional reaction to this suggestion is illuminating. He is also asked why so many prisoners lead no better lives after release, why the reformatory is a good place to reform in, etc. Some prognosis can thus be formed as to his chances for making good when he leaves the reformatory.

These two writers both recognize the individuality of each problem, and emphasize that delinquents should be examined, not by any cut-and-dried methods, but by an intensive individual psychological study, and when this is grasped fully by criminologists we shall have a more enlightened manner of handling offenders. In too many instances, even where the custom of examining inmates mentally is in vogue, the method in use is the hasty and formal applica-

tion of some such scheme of tests as the Binet-Simon, often by an assistant or social worker, unskilled in psychology. Naturally the results obtained are of little practical use.

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### THE MOSELEY MEMORIAL.

THE seventieth anniversary of Ether Day was observed at the Massachusetts General Hospital with appropriate ceremonies on October 16, 1916. In the morning there were clinics and demonstrations at the Hospital and in the afternoon the award of diplomas to house officers and the Ether Day address by Dr. Haven Emerson, health commissioner of New York. It is expected that this address will be published in full in a later issue of the JOURNAL.

The anniversary of Ether Day has particular interest this year on account of the formal dedication and opening of the Moseley Memorial Building, the new administrative headquarters of the Hospital. This building, representing a cost of about \$250,000, is the gift of Mr. Charles W. Moseley, of Newburyport, Mass., in memory of his cousin, Dr. William O. Moseley, a former house pupil at the Massachusetts General Hospital, who met his death in 1879 while climbing the Matterhorn. At the dinner of the House Pupils' Alumni Association, held in the evening at Hotel Vendôme, a narrative of Dr. Moseley's life was given by Dr. John W. Eliot, his classmate. Dr. Haven Emerson spoke on the work of the New York Health Department during the recent epidemic of poliomyelitis and there were other addresses by Dr. Elbridge G. Cutler, the retiring president; by Dr. Hugh Cabot; and by Dr. William F. Whitney, the newly elected president of the Association for the ensuing year.

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### SUFFOLK DISTRICT CENSORS' EXAMINATION.

ATTENTION is called to the notice of examination for admission to the Suffolk District of the Massachusetts Medical Society, which was published in last week's issue of the JOURNAL, and is repeated in the present. The importance from every standpoint of belonging to the official medical organization of the state in which he



lives should be obvious, not only to every practitioner, but to every recent graduate in medicine. As an immediate sequel to state licensure, membership in the state medical Society is the ultimate index of approved competence. All qualified regular physicians, who have not already done so, should take the coming examination with a view to permanent membership in the Massachusetts Medical Society.

### MEDICAL NOTES.

**LONDON DEATH RATES IN AUGUST.**—Statistics recently published show that the total death rate of London during the month of August, 1916, was only 10.6 per thousand inhabitants living. Among the several districts and boroughs the highest rate was 14.5, in Holborn, a crowded central slum, and the lowest was 7, in Hampstead, an open suburb on the north.

**ALVARENGA PRIZE.**—The College of Physicians of Philadelphia announces that the next award of the Alvarenga prize, being the income for one year of the bequest of the late Señor Alvarenga, and amounting to about \$250, will be made on July 14, 1917, provided that an essay deemed by the Committee of Award to be worthy of the prize shall have been offered.

Essays intended for competition may be upon any subject in medicine, but cannot have been published. They must be typewritten, and if written in a language other than English should be accompanied by an English translation, and must be received by the Secretary of the College on or before May 1, 1917.

Each essay must be sent without signature, but must be plainly marked with a motto and be accompanied by a sealed envelope having on its outside the motto of the paper, and within the name and address of the author.

It is a condition of competition that the successful essay or a copy of it shall remain in possession of the College; other essays will be returned upon application within three months after the award.

The Alvarenga prize for 1916 was not awarded.

**PREVALENCE OF DISEASE IN THE UNITED STATES.**—The weekly report of the United States Public Health Service for October 6 states that during the month of August, 1916, there were reported in Arkansas 1117 cases of malaria and 206 of typhoid. In California during the same period there were 161 cases of malaria, 57 of pellagra, and 163 of typhoid.

**TWO MEETINGS OF MEDICAL INTEREST.**—The twenty-sixth annual session of the New York and New England Association of Railway Surgeons was held in New York City on Wednesday and Thursday of last week, October 18 and 19, under the presidency of Dr. D. H. Lake of Kingston, Penn. There were clinics at the New York City Hospitals. The address in surgery was on "Some Practical Points of the Cancer Problem," by Dr. William S. Bainbridge; and among other papers presented there were symposia on "Anesthesia" and "Bone Surgery." Dr. Fred B. Lund of Boston presented a paper on "The Value of Local Anesthesia in Surgery."

The thirteenth session of the Massachusetts State Conference of Charities is to be held in Lowell, Mass., on October 25, 26 and 27. The principal topics to be considered at the several sessions are "Next Steps in Child Welfare," "Present Needs of Working Children," "Housing and Social Progress," "Organized Charity and Social Progress," and "Aid to Mothers with Dependent Children."

On October 25, a meeting of the Boston Conference on Illegitimacy was held at Tewksbury, Mass., at 3.30 p.m. A cordial invitation to attend this meeting is extended to interested members and guests of the State Conference of Charities, to whom an opportunity was afforded to observe the various activities of the infirmary at Tewksbury.

**POSSIBILITY OF NOVOCAINE ADDICTION.**—In the issue of the JOURNAL for October 5, we commented editorially on the possibility of the establishment of novocaine addiction among those for whom the obtainment of cocaine has become impossible. In this connection our attention has been called to the following passage from the "London Letter" in the *Journal of the American Medical Association* for August 26, 1916, on the subject of substitutes for cocaine in dentistry.

"The accidents arising from the use of cocaine by the large number of unqualified persons who practice dentistry has led the Government to restrict the use of this drug. The Government has arranged to make available a sufficient supply of novocaine for use as a local anesthetic, in place of cocaine, by practicing dentists, whether registered or unregistered. As the supply is not immediately available in the particular forms usually required for dental purposes, and three or four weeks may elapse before it can be made available in these forms, the Government has granted a temporary permit to all persons engaged, July 28, 1916, in the bona fide practice of dentistry, but not to purchase preparations containing more than 1% of cocaine, adapted for use as local anesthetic in connection with dental work, subject to the condition that the preparations are used as local anesthetics in connection with such work and for no other



purpose. The permit will remain in force until September 15 next. After that date it will not be legal for unregistered dentists to continue to use cocaine preparations. Public notice will be given in good time, stating how and where the novocain preparations can be obtained. The Government calls attention to the fact that eucain is being manufactured on an increasing scale in this country, and it is probable that considerable supplies of this drug also will be available shortly to meet the demand for local anesthetics for dental purposes."

As a matter of fact, we are informed that since the Harrison law went into effect, there have been instances in which cocaine habitués tried to make use of novocaine, but to their vexation found it to have no stimulating or exhilarating properties.

**CHOLERA IN JAPAN.**—During the past summer Asiatic cholera has been epidemic in Japan, where a total of about 3000 cases have occurred. Report from Tokyo, on September 12, stated that the disease had recently made its appearance in that city, where there had been about eighty cases with thirty deaths. The weekly report of the United States Public Health Service for September 29, 1916, noted the occurrence of 353 cases of Asiatic cholera at Osaka, and of 262 cases, with 107 deaths, in Nagasaki.

#### EUROPEAN WAR NOTES.

**AMERICAN RED CROSS IN SERBIA.**—An insight into gratifying civilian relief activities, which are being directed in Serbia for the American Red Cross by Mr. Edward Stuart and Dr. Edward Ryan, is given by two letters just received at Red Cross headquarters from Mr. Stuart in Belgrade, the captured former Serbian capital, dated August 28 and September 13. Mr. Stuart first went to Europe for the American Red Cross early in 1915 as the head of a supplemental force of skilled American sanitarians and participated in the suppression of the deadly typhus epidemic of that year, while Dr. Ryan piloted into Serbia by way of Greece, some months prior to that, the first detachment of American Red Cross surgeons and nurses which served in Belgrade, caring for both Serbian and Austrian wounded and typhus victims for over a year.

An Associated Press dispatch, as late as October 9, said, owing to the inability of the American Red Cross relief commission to obtain further supplies from Roumania, the work directed by Mr. Stuart probably would be terminated with the exhaustion of the supplies on hand toward the end of November. The number of persons depending on the commission for relief of one kind or another was then given at 36,000. Approximately 3180 tons of food, in addition to 10 earloads of clothing, had been distributed.

The American Red Cross by means of relief materials obtained in the United States and Roumania and contributed by the Swiss Government, and aided by Austrian military authorities, had succeeded in tiding the needy Serbians over the lean period of the year while the crops were growing. While starvation conditions had been relieved, there was still an urgent need for clothing, and Mr. Stuart hoped this want would be supplied from the United States.

The first of the two letters from Mr. Stuart, above referred to, was written just after Roumania had declared war upon Austria-Hungary. Roumania has been the source of large stores of relief supplies which Mr. Stuart has been purchasing for the American Red Cross not only for the relief work he is directing in Belgrade, but for Dr. Ryan's party to the south. Prior to the declaration of war, Mr. Stuart had procured across the Roumanian frontier 257.5 earloads of supplies, including eighty earloads of maize shipped from Bechet.

**WAR RELIEF FUNDS.**—On Oct. 21 the totals of the principal New England relief funds for the European War reached the following amounts:

Secours National Fund .....	\$220,154.92
Belgian Fund .....	161,327.02
French Wounded Fund .....	127,627.07
Armenian Fund .....	71,844.46
French Orphanage Fund .....	66,984.91
Surgical Dressings Fund .....	48,810.25
Polish Fund .....	45,885.83
Italian Fund .....	26,028.04
Prince of Wales Fund .....	15,469.67
Permanent Blind Fund .....	13,379.12
French Phthisis Fund .....	5,277.00
Russian Refugees Fund .....	2,609.00

#### MEXICAN NOTES.

**MEDICAL PREPAREDNESS.**—In a recent issue of the *Military Surgeon* is published an editorial commenting on the present preparedness of the United States Army Medical Corps as contrasted with its inefficiency at the time of the Spanish-American War, and referring also, in conclusion, to the demonstrated efficiency of the Medical Reserve Corps:

"1898 found the medical department of the Army unprepared; 1916 finds it in a high state of efficiency. The lesson of the Spanish-American War was a bitter one. The Medical Corps has 'chewed over it' ever since and determined that the mistakes (many of them due to ignorance and deficient equipment and personnel) would never be repeated. It has been the 'under dog' whenever promotion, increase of numbers and appropriations by Congress have been concerned. It has maintained an uphill fight with the line, as well as with the public, but it has come into its own.



"Whatever sharp criticisms have been made with regard to the unpreparedness of State and Federal government in connection with the present mobilization, the doctors have not been caught napping. Few in numbers—for the ample provisions of the Army bill had not been established by law—the corps had foreseen the emergency and provided for it. Our troops at the border are actually safer than they would be at home, surrounded by every protection known to modern science, due to the developments in camp sanitation and preventive medicine since 1898. The earnest, but untrained medical officers of the guard have received at least theoretical instruction during these years, and in camp and garrison they have at their elbows the cream of the Medical Corps as their advisers.

"Hasty and superficial as were necessarily the physical examinations at the armories from which raw recruits were unwisely (as we knew at the time) rushed to the border, they were as far as possible checked up by responsible U. S. A. officers, not influenced by the 'fear or favor' which must naturally hamper those in the guard, especially in passing on their own commanding officers.

"Had the original plan of mobilizing in home camps been adhered to, the result would have been far better, but even with chaotic conditions and feverish haste of the first few days, good work was done in weeding out the unfit, though willing, candidates.

"Complaints about bad food, neglect, suffering on trains, poor hospital accommodations, etc., were bound to come, and much sympathy has been expended on our citizen soldiers, which they generally decry. Of course, the medical department is the scapegoat. The doctors are not to blame. As in 1898, it is the company commanders who are more often at fault, through lack of experience rather than neglect in their part.

"In the regular army the line and Medical Corps work together for a common end—to maintain the efficiency of the organization. Lead Captain Andrews' 'Fundamentals' and the explanation will be clear, even to the layman.

"Every captain is responsible for the health, physical and moral, of his men and cannot shift that responsibility. Before his own ease, comfort, or convenience, these should be paramount. In the army, on the train or transport, in camp, and on the field of battle, they look to him. The doctor is equally interested in maintaining their efficiency and will cooperate, as far as possible, not only in strictly medical matters, but in matters not entirely within his own sphere. The company commander will heed his advice, or treat it lightly. This was the great lesson of 1898 and should be that of 1916. Incidentally, attention may be called to the fact that the Medical Reserve Corps (inactive) has also made good. Many of its members have been ordered to the border, to home and foreign stations, and

have responded promptly and cheerfully like true soldiers. There has been nothing spectacular about their departure. One by one, as their orders came, they have donned the khaki, dropped their work and devoted themselves with single purpose and energy to such duty as was assigned to them, regardless of loss of patients or financial considerations.

#### BOSTON AND NEW ENGLAND.

**THE WEEK'S DEATH RATE IN BOSTON.**—During the week ending Oct. 21, 1916, the number of deaths reported was 213, against 179 for the same period last year, with a rate of 15.68, against 12.44 last year. There were 34 deaths under one year of age, against 28 last year; and 65 deaths over 60 years of age, against 54 last year.

The number of cases of principal reportable diseases were: diphtheria, 31; scarlet fever, 14; measles, 3; whooping cough, 11; typhoid fever, 3; tuberculosis, 34.

Included in the above were the following cases of non-residents: diphtheria, 10; scarlet fever, 5; typhoid fever, 4.

Total deaths from these diseases were: diphtheria, 2; measles, 2; typhoid fever, 3; tuberculosis, 16.

Included in the above were the following deaths of non-residents: measles, 2; tuberculosis, 1; typhoid fever, 3.

**BROCKTON (MASS.) HOSPITAL.**—The annual report of the Brockton Hospital, Dr. Loring B. Packard, superintendent, states that the total number of ward patients treated during the past year was 1162, an increase of 8% over the previous year. There was an increase in the out-patient department of 17.5%. The maternity service, however, has shown the greatest gain. The capacity of the Hospital is not sufficient to care for its rapidly growing demands, and plans are being made to raise funds sufficient to erect additional buildings for nurses' home and wards.

**BRIGHAM HOSPITAL TRAINING SCHOOL.**—The graduating exercises of the school for nursing at the Peter Bent Brigham Hospital, Boston, were held on Thursday evening of last week, October 19. There was a reception following the award of diplomas to 22 nurses.

**NEW ENGLAND TUBERCULOSIS CONFERENCE.**—The third annual New England Conference on Tuberculosis was held in New Haven, Conn., on October 12, 13 and 14, with three hundred delegates in attendance. The principal topics of discussion were compulsory health insurance and the various methods of combating tuberculosis. Leading addresses were made by Mr. Bailey B. Burritt and Edward Hochhauser of New York, and Dr. Joseph J. Pratt and Mr. Seymour H. Stone of Boston.



**VERMONT MEDICAL SOCIETY.**—The 103d annual meeting of the Vermont Medical Society was held at St. Johnsbury, Vt., on October 12 and 13. The leading address was by Dr. John R. Williams, of Rochester, N. Y. Dr. Clarence H. Beecher of Burlington, Vt., was elected president of the society for the ensuing year.

**HOSPITAL BEQUEST.**—The will of the late Sarah C. Winn of Cambridge, Mass., which was recently filed at the Middlesex Probate Court, contains a bequest of \$1000 to the Nantucket Cottage Hospital.

**COURSES FOR DENTAL NURSES.**—The Forsyth Dental Infirmary has established a course for dental nurses, planned to conform with the dental registration law passed in Massachusetts last year. By this law dental nurses or hygienists are permitted to work in any public institution, but not in private offices. Candidates for entrance to this course must be 18 years of age, and must present certificates of graduation from approved high schools or the equivalent of a four-year high school course. A small tuition fee is charged.

### Massachusetts Medical Society.

#### ESSEX NORTH DISTRICT MEDICAL SOCIETY.

A quarterly meeting of Essex North District Medical Society was held at Wolfe Tavern, Newburyport, October 11, 1916, with the President, Dr. F. B. Pierce of Haverhill in the chair.

An interesting and classical paper was presented by Dr. Henry Jackson, of Boston, upon "Abdominal Pain." A valuable discussion upon the paper occurred, opened by Dr. C. E. Durant of Haverhill.

Following the scientific section of the program, the question of the injustice of the Workmen's Compensation Act of Massachusetts, toward employee and physician, was considered, and methods for alleviation were discussed.

It was voted that the business of the First Legislative Convention of Massachusetts Physicians, on Sept. 20, 1916, be ratified.

It was voted that the fund raised by the dollar assessment upon members of Essex North, called on Aug. 16, 1916, be devoted to the work of its Committee upon the Workmen's Compensation Act, as specified in its call.

The next meeting of the Society will be held Wednesday, January 3, 1917, at Haverhill, and the reader will be Dr. J. L. Morse, of Boston.

J. FORREST BURNHAM,  
Secretary.

### Miscellany.

#### RÉSUMÉ OF COMMUNICABLE DISEASES FOR SEPTEMBER, 1916.

**INFANTILE PARALYSIS** has practically monopolized the attention of the Department during the month of September. The other important facts on the communicable disease reports for the month were the small number of cases of diphtheria and the explosive outbreak of typhoid fever in Lynn.

**PREVALENCE.** The number of cases of communicable diseases reported to this Department was somewhat in excess of the figures for September, 1915. This was due largely to the increased prevalence of anterior poliomyelitis. The other common communicable diseases, with the exception of diphtheria, have maintained their usual prevalence in the State.

	TOTAL CASES REPORTED		
	SEPT., 1915	SEPT., 1916	AUG., 1916
Cases .....	2959	3234	3142
Case incidence per 100,000 population	80.2	85.5	83.2

**Measles.** There has been a still further decline in the number of measles cases reported to this Department. There are no cities or towns in the Commonwealth at the present time which are having an unusual amount of this disease.

	TOTAL CASES REPORTED		
	SEPT., 1915	SEPT., 1916	AUG., 1916
Cases .....	156	175	595
Case incidence per 100,000 population	4.2	4.6	15.7

The following cities and towns have exceeded their measles endemic index for September:

(Endemic index signifies the average for five years of reported cases exclusive of epidemics. This index is applied to each city and town for each month for every communicable disease. The numbers in parenthesis after the names of each city and town indicate the endemic index for that city or town. The numbers without parenthesis indicate the cases reported during the current month.)

Fall River .....	(6)	15
Lowell .....	(5)	29
Southampton .....	(0)	7

**Diphtheria.** The reduction in the number of reported cases of this disease during September as compared with the same month of last year is striking. On account of the fear of infantile paralysis, many of the schools of the Commonwealth are to remain closed. It will be interesting to note whether this has had any real influence upon the number of cases.

	TOTAL CASES REPORTED		
	SEPT., 1915	SEPT., 1916	AUG., 1916
Cases .....	697	470	460
Case incidence per 100,000 population	18.9	12.4	12.2



While there have been no marked outbreaks of this infection, a number of towns have exceeded their endemic index for the month of September:

Cambridge .....	(14)	29
Natick .....	(0)	14
Fitchburg .....	(3)	23
Ludlow .....	(0)	13
Westfield .....	(1)	10

**Whooping Cough.** There have been no striking features about the whooping cough situation during the month of September. The number of cases has increased slightly over those reported last month and has remained about the same as September of last year.

TOTAL CASES REPORTED			
Cases .....	SEPT., 1915	SEPT., 1916	AUG., 1916
.....	465	271	387
Case incidence per 100,000 population	12.6	7.2	10.2

The following cities and towns have exceeded their whooping cough endemic index for the month of September:

Fall River .....	(6)	29
Brookton .....	(1)	17
Cambridge .....	(9)	16
Haverhill .....	(1)	13

**Typhoid Fever.** There has been an increase in the number of cases of typhoid fever reported to this Department, both as compared with August of this year and September, 1915. This increase has been due largely to the explosive, milk-borne outbreak in Lynn, which will be described under the head of epidemics. However, Fall River has shown an unusual prevalence of typhoid fever and North Adams has reported considerably more than the average number of cases.

TOTAL CASES REPORTED			
Cases .....	SEPT., 1915	SEPT., 1916	AUG., 1916
.....	322	373	265
Case incidence per 100,000 population	8.7	9.8	7

The following cities and towns have exceeded their typhoid fever endemic index for the month:

Fall River .....	(18)	53
Lynn .....	(49)	88
North Adams .....	(43)	9

**Scarlet Fever.** The number of scarlet fever cases reported to this Department shows an increase when compared with last month, and a decrease when compared with the same month of last year. There have been no marked features of the scarlet fever situation.

TOTAL CASES REPORTED			
Cases .....	SEPT., 1915	SEPT., 1916	AUG., 1916
.....	299	203	178
Case incidence per 100,000 population	8.1	5.4	1.7

The following cities and towns have exceeded their scarlet fever endemic index for September:

Marion .....	(0)	5
Norwood .....	(0)	6

**Pulmonary Tuberculosis.** There are no interesting facts to report about pulmonary tuberculosis for the month. There were practically the same number of cases reported during the month just closed as the same month of last year.

TOTAL CASES REPORTED			
Cases .....	SEPT., 1915	SEPT., 1916	AUG., 1916
.....	610	602	589
Case incidence per 100,000 population	16.5	15.9	16.6

**Rare Diseases.** Dysentery was reported from Boston (22), Lexington (1), and Haverhill (3). Dog-bite was reported from Attleboro (1), Brockton (1), Fall River (1), Hull (3), and Lowell (1).

Cerebrospinal Meningitis reported from Boston (7), Lowell (3), Fall River (1), North Adams (1), Greenfield (1), Worcester (1), Everett (1), and Haverhill (1).

Pellagra was reported from Boston (1), Lynn (1) and Worcester (3).

Trachoma was reported from Boston (9), Chelsea (2), Hanson (1), and Lowell (1).

Malaria was reported from Boston (6), Newton (1), North Attleboro (2), Worcester (1), Fall River (1), Everett (1), Dedham (1), Haverhill (1), Cambridge (1), Uxbridge (3) and Chelsea (1).

Tetanus was reported from Nantucket (1) and Worcester (1).

Septic sore throat was reported from Boston (4), Amherst (1) and Taunton (1).

#### EPIDEMICS.

**Anterior Poliomyelitis.** Anterior poliomyelitis has continued to be reported from all parts of the State during the month of September. The total number of cases for the month was 626. This makes a total of 1016 cases reported to this Department since the first of January. For the sake of clearness, the special features of the disease will be discussed under individual heads:

**Distribution.** The distribution of the cases constitutes one of the peculiar features of the epidemic. This applies to the State as a whole, as was stated last month. There is a distinct localization of foci of infection.

**Report of Cases.** The reports from Adams and North Adams indicate that in this vicinity the infection has exhausted its susceptible period. In Pittsfield there has been a gradual increase in the number of cases reported during the month, with an additional focus of infection in the neighboring town of Dalton. There were no cases reported from the Greenfield-Montague area during September. This is also true of the lower border of the State in the Dudley-Webster



area, while Worcester reported only seven cases during the month.

The focus of infection, localized along the Merrimac River, mentioned in last month's summary, has continued to be an important factor of the month's report. There has been some extension of the infection to North Andover, Boxford, Georgetown, Newbury and Southboro. However, at the present time, the two most important foci are Boston and the Connecticut Valley area, with Holyoke as a center. Holyoke has continued to report cases in increasing numbers. This can also be said of Springfield, while Westfield and Northampton have remained quiescent.

The Metropolitan area has become a very active focus of the infection. Boston, which only reported eight cases in July and August, had 172 in September. Many of the surrounding towns have begun to report cases in small numbers, and it appears that the area will become the most important focus of the infection within the State.

*Characteristics.* Up to the present time the cases of anterior poliomyelitis have continued to affect the usual age group. The majority of the cases are under ten years of age. This characteristic is one of the most constant features of the disease. Any theory that will explain this infection must satisfactorily explain the constancy with which this age group of the population is attacked.

The following is a list of the cases reported from the various cities and towns during the month of September:

Boston	172	Weymouth	3
Holyoke	59	East Bridgewater	3
Springfield	39	Leominster	3
Pittsfield	32	Milford	3
Malden	18	North Attleboro	2
Cambridge	14	Tisbury	2
Newburyport	13	Boxford	2
Quincy	12	Danvers	2
Somerville	10	Hamilton	2
Everett	10	Saugus	2
Lynn	9	West Newbury	2
Chicopee	8	Newbury	2
Amesbury	9	Ludlow	2
Beverly	8	Monson	2
Medford	9	Hillieria	2
Revere	8	Melrose	2
Worcester	7	Waltham	2
North Adams	8	Woburn	2
Adams	5	Brookton	2
Dalton	5	Winthrop	2
Haverhill	5	Blackstone	2
Newton	5	Fitchburg	2
Lowell	5	Barnstable	1
South Hadley	5	Bourne	1
Braintree	5	Great Barrington	1
Dedham	5	Mount Washington	1
Chelsea	5	Otis	1
Andover	5	Stockbridge	1
Warren	5	Mausfield	1
West Springfield	4	Taunton	1
Brookline	4	Gloucester	1
Milton	4	Marblehead	1
Fall River	3	Middleton	1
Belmont	3	Nahant	1
Winchester	3	Methuen	1

North Andover	1	Waketfield	1
Rockport	1	Watertown	1
Salem	1	Westford	1
Swampscott	1	Weston	1
Barnardston	1	Nantucket	1
Conway	1	Dover	1
Greenfield	1	Foxborough	1
Agawam	1	Norwood	1
Palmer	1	Plainville	1
Southwick	1	Stoughton	1
Westfield	1	Wellesley	1
Hadley	1	Bridgewater	1
Northampton	1	Hull	1
Williamsburg	1	Rockland	1
Framingham	1	Lunenburg	1
Hudson	1	Princeton	1
Lexington	1	Oxford	1
Marlborough	1	Southbridge	1
North Reading	1	Westminster	1
Stoneham	1	Leicester	1
Tewksbury	1		

*Mortality.* From the incomplete records received by this Department, the anterior poliomyelitis fatality rate for September was higher than for August. There were 626 cases reported with 136 deaths, giving for a fatality rate 21.6, as compared with the fatality rate of 15.2 for August. A more detailed analysis of these rates will be made when the final and complete figures are received from the Secretary of State's office.

*Typhoid Fever.* Beginning August 28, until the end of September, there were reported from Lynn 114 cases of typhoid fever. This outbreak illustrates very strikingly the extensive character of milk-borne typhoid fever, for the investigation of this epidemic showed that all of the cases were on the road of a single milk dealer.

A careful analysis of the source of this milk dealer's supply was made. Most of the milk was produced upon his own farm. Smaller quantities were purchased regularly from an adjoining farm, while for a short period a temporary supply was secured through a neighboring contractor, to whom it came from New Hampshire. These sources of supply have all been thoroughly investigated and examination of the individuals having to do with the handling of milk secured. While the primary source of the infection of this milk supply has not been definitely proven, the reculturing of the specific individuals is not yet complete.

This milk supply was excluded from the city of Lynn until the dealer installed a modern pasteurizing plant.

A detailed report of this outbreak will be published in the later number of the *Bulletin*.

## ARMY SURGEONS AS MILITARY COMMANDERS.

In the issue of the *Paris Médical* of April 1, 1916, quoted in the *British Medical Journal* of September 30, Dr. H. Raymondaut narrates the story of two French surgeons who



rose to high military command during the Napoleonic Wars.

"Jean Pierre Joseph Bruyère was born in 1772 and served in the campaign of Italy as a surgeon of the first class. Preferring arms to the doctor's gown, he obtained, through the influence of Larrey, a captain's commission. He was a first-class fighting man and promotion was rapid. As colonel of the 23d Chasseurs he went through the campaigns of 1805 and 1806, being made brigadier-general after the battle of Jena. He was created a baron of the Empire in 1808 and a count in 1811. As a general of division he commanded Masséna's light cavalry in the Russian campaign in 1812. He was a man of impetuous valour, and was wounded at Eylau, Wagram, and Moscow, finally dying after amputation through both thighs at the battle of Bautzen in 1813. The other, Jean Baptiste Rusea, was born in 1759, and served as a medical officer in the army of Italy in 1793. In that campaign he was given a combatant commission, and for its conduct at Loasso he was made a brigadier-general on the field of battle. He was promoted general of division in 1799. He was severely wounded at Lodi, and again at Trebbia. In 1801 he was in command of the island of Elba, in 1814 he was killed on the ramparts of Soissons, being then at the head of a division of the National Guards."

Paul Triare, in his "Dominique Larrey and the campaigns of the Revolution and the Empire," also quoted in the same issue of the *British Medical Journal*, recounts the adventures of Colonel Lawless of the Scottish Legion:

"a learned physician who had been professor of physiology in the University of Dublin. His taste for soldiering and his hatred of England led him to take service as a combatant under Napoleon. He was wounded at Kulm in 1813, and Larrey amputated his leg below the knee. Lawless, who as a doctor knew the dangers of the hospitals of that time, mounted his horse immediately after the operation and rode straight to Mayence, here the first dressing was taken off. Thence he made his way to France, arriving there in good condition without any fresh dressing. Marbot in his *Mémoires* mentions Captain Fournier, adjutant-major to General Morland, commander of the *chasseurs à cheval* of the Imperial Guard. He had entered the army as a surgeon, but through Morland's influence obtained a combatant commission, and was killed with his chief at Austerlitz."

In our own country, the career of General Leonard Wood may be pointed out as a distinguished example of an army surgeon attaining high military command.

#### APPOINTMENTS.

BOSTON DISPENSARY.—Dr. Maynard Ladd has just been appointed Physician-in-chief of the Children's Department of the Hospital for Children of the Boston Dispensary, succeeding Dr. Arthur A. Howard. This appointment is made by the Dispensary, on the nomination of the Harvard Medical School. Dr. Ladd is instructor in pediatrics in the Harvard Medical School, is consultant physician of the Children's Hospital, the Floating Hospital and of the Boston Nursery for Blind Babies; a member of the American Medical Association, the American Pediatric Association, the Massachusetts Medical Society, etc. The Boston Dispensary Hospital for Children, the children's out-patient clinics, and the children's preventive clinic will be under his charge. Teaching in pediatrics to students of the Harvard Medical School will be carried on at the Dispensary under his direction. Dr. Elmer W. Barron will continue as Associate Physician of the Department, and will give instruction, as in the past years, to students of the Tufts Medical School.

#### RECENT DEATHS.

DR. DAVID FRANCIS LINCOLN, a retired Boston physician, hygienist and author, died suddenly, October 17, at his home, 131 Myrtle street. Dr. Lincoln was born in Boston, January 1, 1841, and was the son of William L. Lincoln. He studied at Harvard, was graduated in the class of '61 (the same class as Drs. H. P. Bowditch and O. W. Holmes), and three years later from the Harvard Medical School. For eighteen months during the Civil War, he was acting assistant surgeon in the United States navy, and thereafter for a long time he devoted his attention to nervous diseases and did more or less lecturing and writing in connection with Hobart College at Geneva, N. Y., after having retired from actual practice. At one time he was secretary of the American Social Science Association and he was a member of the Twentieth Century Club. He was the author of a number of medical works, published from time to time, and was a frequent contributor to medical journals. He never married. His survivors are three brothers, Walter M. Lincoln of the Brookline Savings Bank, William E. Lincoln of the Boston real estate firm of William Lincoln & Son, and Rev. James Otis Lincoln of San Francisco, Cal.

Dr. Lincoln was a Fellow of the Massachusetts Medical Society from 1865 until 1883, when he resigned. He moved to Geneva, N. Y., in 1881.

DR. VINCENT VON CERNY, senior professor of surgery at the University of Heidelberg, has died recently at the age of seventy-four years.

DR. ALBERT FRANKEL, who died in Berlin on July 6, was born in 1818. He was one of the earliest pupils of von Leyden, and was a nephew of the famous Traube. For many years he was director of the medical section of the Urban Hospital in Berlin, where he was a prominent physician and enjoyed an extensive consultant practice. His chief distinction is due to his discovery of the pneumococcus as the etiologic agent of lobar pneumonia; but in spite of this and of his notable contributions to medical literature on the subject of respiratory diseases, he never received a university appointment. He was a founder and for many years president of the Association for Internal Medicine of Berlin.

DR. HERBERT MARSHALL HOWE, who died on October 1 at Bristol, R. I., was born in Roxbury, Mass., on July 16, 1841. He received the degree of M.D. from the Medical College of the University of Pennsylvania in 1865, and thereafter served for five years as resident physician of the Episcopal Hospital, Philadelphia. He then relinquished the practice of medicine and went into business, in which he made a large fortune. He is survived by his widow, four daughters, and five brothers.



DR. ADONIRAM BROWN JUDSON, who died on September 20 in New York City, was born in 1837. He received the degree of A.B. from Brown University and that of M.D. from Harvard. He made a specialty of orthopedic surgery and was president of the American Orthopedic Association in 1891.

DR. EDWARD KIRSCHNER, who died recently at Hagerstown, Md., was born in 1839. He was assistant surgeon aboard the battleship *Cumberland* when it was sunk by the *Merrimac* during the Civil War. Subsequently he became a United States Medical Inspector, retiring with the rank of Commander.

DR. JOSEPH L. LOCKARY, of Roxbury, Mass., who died recently at St. Stephens, N. B., was a native of the latter city. He studied medicine at McGill University and at the Harvard Medical School, from which he graduated in 1897. He was a Fellow of the Massachusetts Medical Society. He is survived by one son.

DR. WILBUR P. MARBLE, of New York City, who died on August 30, at Kennebunkport, Me., was born in 1863. He was a practitioner of ophthalmology in New York. He is survived by his widow and one son.

DR. GEORGE WHITEHOUSE RYAN, who died at Boston on September 16, was born in this city on July 16, 1871. After attending the United States Naval Academy, he received the degree of M.D. from the Tufts Medical School. After serving as an ensign during the war between Spain and the United States, he resumed the practice of medicine, and for several years served as surgeon-in-chief at the Brockton, (Mass.) Relief Hospital and at the Grace Hospital, Boston.

DR. EZRA BRADWAY SHARP, who died on August 23, at Camden, N. J., was born in 1861. He received the degree of M.D. from the University of Maryland in 1888, and since 1897 had practiced his profession in Stomach, where he was instructor in diseases of the stomach at the local polyclinic hospital.

DR. EUGENE P. STONE, U. S. N., who died recently at North Sutton, N. H., was a native of Boston. He received the degree of M.D. from the Harvard Medical School in 1886, and subsequently entered the United States Naval Medical Service, where he became surgeon and had served at the Charlestown Navy Yard, at Annapolis and in the Naval Hospital at Manila, P. I. He is survived by his widow and two sons.

DR. GEORGE BRINTON WILSON, who died on October 1, at Chelsea, Mass., was born at Kittery, Me., on June 17, 1863. He received the degree of M.D. from the Dartmouth Medical School and subsequently from the University of Pennsylvania, and was appointed to the United States Navy Medical Corps on February 1, 1889. He sought active service in the Spanish-American War and was for several years fleet surgeon of the Asiatic Squadron. On June 1, 1912, he was appointed medical director and commandant of the United States Naval Hospital at Chelsea.

DR. STOCKBRIDGE P. GRAVES, who died on October 12, at Saco, Me., was born at Topsham, Me., in 1826. He was graduated from the New York Homoeopathic Medical College in 1866, and was the oldest homoeopathic practitioner in Saco and Biddeford, Me.

DR. ARTHUR L. HUNT, who died of anterior poliomyelitis, on October 8, in Washington, D. C., was born at Lewiston, Me., in 1877. He received the degree of A.B. from Bowdoin College, and studied medicine in Washington, D. C. After practicing for a time in that city, he became an inspector for the Health Department of the District of Columbia. In this capacity, he had exercised supervision over cases of poliomyelitis during the recent epidemic. He is survived by his widow.

DR. WILLIAM APPLETON MURKITT, F.R.C.S., who died recently in Massingham, Norfolk, England, was born at Philadelphia in 1817. He obtained his medical education in London and Edinburgh, and subsequently became a naturalized British subject. He specialized in abdominal surgery and was formerly

consulting surgeon of the Samaritan Hospital. He retired from active practice several years ago. He is survived by two daughters and one son and by his widow, who was Miss Caroline Green, a niece of Dr. Samuel A. Green of Boston.

DR. MATTHEW WOODS, who died recently at Philadelphia, was born in Ireland in 1849. After obtaining his preparatory education in that country, he migrated to the United States shortly after the outbreak of the Civil War, and served for over three years in the United States navy. He received his medical degree from the University of Pennsylvania, and subsequently became a practitioner in that city. He was a member of numerous medical and scientific societies and was the author of several monographs on epilepsy. He is survived by his widow.

DR. JAMES J. O'BRIEN, who died recently at Somerville, Mass., was born in that city on June 24, 1873. He was graduated from the Harvard Dental School in 1901, and was for several years instructor in extraction and anesthesia. He was a member of the Harvard Odontological Association. He is survived by his widow, one daughter and two sons.

#### SOCIETY NOTICES.

**SUFFOLK DISTRICT MEDICAL SOCIETY.**—A stated meeting of the Suffolk District Medical Society, in conjunction with the Boston Medical Library, will be held at the Library, on Wednesday, October 25, at 8.15 P.M.

The meeting will be a symposium in consideration of Workmen's Accident and Sickness Insurance in their Relation to the Medical Profession. There will be papers by Dr. F. J. Cotton of Boston, Mr. John P. Mead of Brockton, Dr. W. H. Merrill of Lawrence, and Dr. F. D. Donoghue of Boston.

**NORFOLK DISTRICT MEDICAL SOCIETY.**—A stated meeting of the society will be held at the Norfolk State Hospital, Wrentham, on Tuesday, October 31, at 4 P.M.

Members may go by automobile from Forest Hills Square by Washington street, through Dedham, Norwood and Walpole. Distance, about 20 miles from Forest Hills Square to Wrentham.

#### PROGRAM OF MEETING.

William H. Prescott, M.D., "The History of the Norfolk State Hospital."

Irwin H. Neff, M.D., "Alcoholism from a Medical Viewpoint."

Frank H. Carlisle, M.D., "The Drug Treatment of Morphism."

The Sessions will meet on November 9, at 2 P.M., for the examination of candidates.

BRADFORD KENT, M.D., *Secretary*.

**MASSACHUSETTS MEDICAL BENEVOLENT ASSOCIATION.**—The annual meeting will be held at the Boston Medical Library on Thursday, Oct. 26, 1916, at 5.30 P.M. The Council will meet at the same place on that date at 5.15 P.M.

GEORGE B. SHATTUCK, M.D., *President*. ROBERT M. GREEN, M.D., *Secretary*.

#### NOTICES.

**SUFFOLK DISTRICT MEDICAL SOCIETY, CENSORS' EXAMINATION.**—The censors of the Suffolk District Medical Society will meet to examine candidates for admission to the Massachusetts Medical Society at the Boston Medical Library, 5 The Fenway, on Thursday, November 9, at 4 P.M.

Candidates, who must be residents of the Suffolk District or non-residents of Massachusetts, should make a personal application, at least three days before the examination, to the Secretary, at 355 Marlborough street, between 4 and 5 o'clock, P.M. (except Saturdays and Sundays), and present their medical diplomas.

DAVID CHEEVER, *Secretary*, Suffolk District Medical Society.



# The Boston Medical and Surgical Journal

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## Original Articles.

### RELATION OF THE DEEP CUL-DE-SAC TO PROLAPSE OF THE RECTUM AND UTERUS, AND TO RECTOCELE.\*

BY DANIEL FISKE JONES, M.D., BOSTON.

THE difficulty of curing a disease is generally in proportion to the number of "cures" for it, and prolapse of the rectum is no exception to this rule. Few surgical conditions are less satisfactory to treat, as will be seen by looking over the records of the operated cases.

Before taking up the subject it will be well to state that this paper does not consider the cases under ten years of age, as I believe the problem is quite different in children than in adults. The term "prolapse" in this paper is intended to include those cases only in which there is a protrusion into or through the sphincter of the whole rectal wall.

It might be stated at this time also that I have practically nothing new to present in this paper; I am simply bringing to your attention facts already stated to which little or no attention has been paid. For about a year before Moschevitz' article came out in 1912, I thought that I had made a discovery. In his paper, Moschevitz intimates that he thought he was getting out something original, but found that Waldeyer, Ludloff, Zuckerkandl, and others had described very accurately the pathological anatomy of the condition, and that Bardenheuer in 1902, and Quénu and Duval in 1909 had published operations very similar to the one he advocated.

If the operations devised for the cure of prolapse of the rectum are taken as evidence, little notice was taken of the work of Zuckerkandl, Ludloff and others, up to the time of Bardenheuer's operation in 1902, as practically all the operations were devised for the purpose of tightening up the sphincter and levators, and narrowing the anal canal so that the prolapse could not get through it. It is a fact that the sphincter and levators are stretched and relaxed to a marked degree in all these cases. That this is not the cause of the prolapse can, I think, be easily demonstrated by an examination of any case in which the prolapse has been held reduced for a few weeks or months, for in these cases the sphincter and levators have regained a normal tone, and are as taut as in any normal individual.

To get a different conception of prolapse of the rectum, let us go back to the work of Zuckerkandl in 1890, Waldeyer in 1899, and to Dix, Ludloff, and others. The idea of these men, based upon anatomical findings, that prolapse of the rectum is a hernia through the sphincter, seems to have made little impression, as Bardenheuer in 1902 was, so far as I can find, the first to make use of the idea. To run over very briefly the work of Zuckerkandl, Moschevitz, and Williams, will be necessary to an understanding of the condition.

The normal pelvis in the male shows a posterior cul-de-sac which reaches to the 2d or 3d sacral vertebra. In multiparae the depth of the cul-de-sac is on a level with the posterior portion of the vaginal vault (Zuckerkandl). In males it reaches just about to the top of the seminal vesicles (Zuckerkandl).

The transversalis fascia, which lines the abdominal cavity, is continued into the pelvis

\* Read at a meeting of the Boston Surgical Society, March 6, 1916.



fascia where it gives support to the pelvic organs. Bardeleben shows this fascia as extending backward in front of the bladder, upward between the bladder and rectum, surrounding the structures at the base of the bladder, then running backward around the rectum to the posterior layer of pelvic fascia.

Williams says, "The pelvic fascia, from its attachment at the brim of the pelvis, sweeps downward and inward to the bladder, with which it is intimately connected, and to the vagina which it splits to enclose, uniting with the fascia from the opposite side, and is attached to the cervix uteri, where it helps to form the vaginal vault. This forms a strong fibrous sling which is the main support of the bladder, and the strongest of the uterine supports. The posterior portion of the fascia is deeper than the anterior, and passes downward and inward to the rectal wall to which it is intimately attached. Posterior to the rectum it covers the pyriformis and is continuous above with the anterior lamella of the lumbar fascia." It is this fascia which Williams says is the support of the uterus, vagina, and bladder. It is, we believe, this fascia which limits the depth of the posterior cul-de-sac. It is this fascia, called by various names in different parts of the abdomen, which has particularly to do with herniae, according to Moschevitz' view. It is behind all vessels and there is a more or less funnel-shaped prolongation onto every vessel, and every organ leaving the abdomen or pelvis. It is this fascia which supports the pelvic organs and the floor of the posterior cul-de-sac. It is a defect in this fascia, the absence of it, or the stretching of it which is responsible for the extension of the cul-de-sac downward to the levator muscles. Zuckerkandl states that a deep posterior cul-de-sac is essential to the formation of perineal, rectal, and vaginal herniae. The manner of formation of the deep cul-de-sac is of interest. It is, we believe, either congenital or acquired.

Zuckerkandl, Freund, and others have shown that this cul-de-sac normally extends to the levators in the foetus, and that the depth is gradually decreased from this time to puberty, when it reaches to the level of the 2d or 3d sacral vertebra.

Moschevitz believes that the fascia is normally attached to the rectum by a funnel shaped extension downward on to it. A defect in this attachment allows the intestines to push downward along the rectum to the levators. The defect, he believes, to be congenital but the sac or deep cul-de-sac is acquired.

Another acquired form is that found in multiparae, due to the stretching of the peritoneum and fascia.

Clinically, there are three distinct varieties of deep cul-de-sac. The first is the variety which we distinguish as congenital, in which the peritoneum lining the deep pelvis is smooth and

closely adherent to the walls of the pelvis and to the rectum and vagina or bladder; the rectum instead of standing out as a definite organ is usually flattened against the sacrum and coccyx, and scarcely distinguishable from the peritoneum. The bladder in males, instead of being a rounded organ occupying the central portion of the pelvis, is flattened posteriorly and at the base, and extends from one side of the pelvis to the other. There is absolutely nothing to indicate the depth of the normal cul-de-sac. This variety is found in the cases of prolapse of the rectum in males and virgins, and in prolapse of the uterus and vaginal herniae in virgins. I have rarely seen a deep pelvis of this form in which there was not either a prolapse of the rectum or uterus, or a rectocele.

In the second form, which we have called the acquired variety, the cul-de-sac is deep, but does not appear so deep as in the first; the peritoneum is redundant and is not adherent to the pelvic walls, rectum and vagina, or bladder. The rectum, instead of being flattened against the posterior wall, stands out distinctly in the pelvis. This form is of frequent occurrence in multiparae, yet the occurrence of prolapse of the rectum is very rare, while prolapse of the uterus and large rectoceles are infrequent in proportion to the number of cases of this acquired deep cul-de-sac.

The third variety is very rare; in these cases there is a small opening between the vagina and rectum reaching from a posterior cul-de-sac in normal position down to the levators, and usually causing a vaginal protrusion. The appearance of this variety would suggest a defect in the posterior portion of the pelvic fascia, through which the intestines had forced their way to the depths of the pelvis. The comparatively small opening with a distinct floor of the posterior cul-de-sac at its normal height suggests the protrusion through a small defect in the fascia, as suggested by Moschevitz as the cause of the deep cul-de-sac, and exactly analogous to the formation of an inguinal hernia.

We have for some time tried to find an explanation of the large proportion of prolapses and vaginal herniae in the first group, that is, congenital variety, as compared with the small proportion found in the second group, that is, acquired variety.

It is our belief that there is not only a congenitally deep cul-de-sac, but that there is an absence of fascia lining the cavity in the congenital group, while in the second group the fascia is stretched by the gravid uterus and childbirth sufficiently to allow the peritoneum to sink into the depths of the pelvis but still leaves it attached to the vagina and rectum. In the first group there is no fascia, the constant pressure of the intestines is against the levators, anterior wall of the rectum and posterior wall of the vagina, and as muscle fibres will not stand a long continued pressure without



stretching, these parts soon give way, and are pushed through the sphincter or out through the vulva. In the second group the fascia, while stretched and thinned, is sufficiently strong to take the strain without stretching. As the anterior rectal wall is stretched downward against the sphincter, they both must give more and more until the rectal wall pushes through the sphincter. The prolapse, when first formed, is always the anterior rectal wall, and as this progresses, the posterior wall is loosened sufficiently to be pulled down also. In place of the rectal wall giving way, the posterior vaginal wall may be stretched, and we have either a rectocele, so called, or a vaginal hernia.

In regard to rectoceles, we believe that there are two distinct conditions which are designated as rectocele. In virgins, the rectocele is always a protrusion of the posterior vaginal wall caused by the intestines in the deep posterior cul-de-sac pushing the wall forward and downward, that is, it is a hernia. The rectum has nothing whatever to do with it, except that the rectum is pulled downward by the lower portion of the posterior wall as it is everted.

In some multiparae with badly torn perineum, and stretched posterior wall of the vagina, we have what may be called a true rectocele, that is, the rectum, having no support anteriorly, bulges into the vagina. The bulging increases very little, because the intra-rectal pressure can be little more than the normal.

The second variety occurs in those cases in which there is a deep posterior cul-de-sac; the intestines force their way downward between the rectum and vagina, and push the posterior wall of the vagina forward and downward. It is, therefore, the intestines in this cul-de-sac which are bulging into the vagina, and not the rectum. If the surgeon after doing a perineorrhaphy on a well-marked case of "rectocele," will open the abdomen and examine the posterior cul-de-sac, he will easily feel his sutures at the lower end of the cul-de-sac, and will still be able to push the posterior wall of the vagina forward over them.

Little has been said of prolapse of the uterus in these conditions of deep posterior cul-de-sac. The uterus is suspended by the anterior portion of the pelvic fascia to some extent, so that even with the loss of support of the posterior portion the uterus does not prolapse at once. The constant pressure of the intestines on the posterior vaginal wall, not only pushing it forward, but forcing it downward toward the vulva, at the same time exerts a considerable pull upon the uterus; this, in addition to the loss of support of the posterior fascia, causes prolapse of the uterus in many cases. It is probable also that the anterior fascia is defective in those cases in which the posterior portion is thus aiding in the prolapse.

It has been my good fortune to see four vir-

gins within the last two years with what I believe to be a congenital deep posterior cul-de-sac. The condition in the pelvis was identical in all. In one there was a prolapse of the rectum, in another there was a prolapse of the rectum, a large "cystocele" and a prolapse of the uterus. In two others there was a "rectocele" and a prolapse of the uterus.

Granted then that prolapse of the rectum, rectoceles, and prolapse of the uterus are caused by deep posterior cul-de-sac and are really herniae, what is the proper treatment for them? For prolapse of the rectum the operations which have been done may be divided into three groups.

1. Those which attempt to prevent the prolapse by supporting the outlet of the pelvis or by narrowing the outlet.

2. Those which attempt to prevent the prolapse by fixation of the bowel above or bring about the same result by amputation of the prolapsed portion.

3. Those which not only suspend the bowel but close the hernial sac at what might be called the internal ring.

Let us consider these operations in groups to save time, taking up only a few special operations; and let us admit for the sake of argument that prolapse of the rectum and uterus are herniae; and we must admit that they are at the time they become fully developed prolapses, whether we believe that the deep cul-de-sac is the cause or the effect of the prolapse.

In the first group we put those operations which attempt to prevent the prolapse or hernia by narrowing the outlet or by supporting the perineum. The evident fact in cases of prolapse is the dilated and atonic sphincter, and a relaxed perineum. The obvious thing to do, therefore, is to tighten up the sphincter, and give more support to the perineum.

In comparing this group of operations with an inguinal hernia, it is evident that the placing of a band about the sphincter is almost exactly similar to closing of the external ring by a suture. Undoubtedly this will hold up a certain number, and so will closure of the external ring prevent a certain number of inguinal herniae from protruding.

The support given to the perineum is similar to tightening up the external oblique fascia, without removing the sac, and this, of course, means a recurrence.

The Tiersch operation of placing a silver wire about the anus is undoubtedly of value in very old or very feeble patients.

The Delorme-Juvara operation of removing a collar of mucous membrane apparently gives excellent results, comparatively speaking, but there is some danger about it. 67% mortality according to Delorme, and the end results, while excellent, according to Delorme, are not sufficiently good to consider it the operation of



choice. Quénu considers it an excellent adjunct to the abdominal operation.

In the second group we have operations which might be compared to pulling the hernial sac up as far as the external ring, and leaving it open above. While most of these operations do give support to the rectum for a time at least, they overlook a very important fact, that is, the rectum at its lower segment has been so stretched by pressure upon it that no amount of pull above will take up the slack here. Besides that, the intestines are free to continue their pressure upon the anterior wall, and ought, in time, to reproduce the prolapse, if it does not immediately.

It will be seen, then, that according to our estimate at least, the operations in Groups 1 and 2 are, at least theoretically, wrong. We must, therefore, find some operation which will be more satisfying, at least theoretically.

In 1912, after a recurrence following the so-called Tuttle posterior rectopexy, and having a patient transferred to me with a recurrence following the same operation done by a colleague, I determined to do a colopexy. The first thing which struck me when I opened the abdomen was the great depth of the pelvis: there was no posterior cul-de-sac at all, the pelvis to the levators was wide open, the rectum was flattened against the sacrum, and the peritoneum evidently rested upon the levators: the sphincter could be easily felt from the cul-de-sac. An attempt was then made to pull the rectum into place by pulling upon the sigmoid, in preparation for a colopexy, but to my surprise I found that a pull upon the sigmoid pulled upon the attachment of the rectum only, and did not pull upon the lower three inches of the rectum itself.

The next patient was a male, and the pelvis presented a most extraordinary appearance. The depth of the pelvis was most striking; it also had the appearance of having no organ in it, for the rectum was flattened out against the posterior surface, and was not easily distinguished from the peritoneum. The bladder, which is ordinarily a rounded organ, had a flattened base, which extended from one side of the pelvis to the other. The seminal vesicles and prostate were pelvic organs, that is, in the portion lined by peritoneum.

As colopexy seemed to offer no hope of curing these patients, an effort was made to restore the cul-de-sac to its normal appearance, by closing it with purse-string sutures of silk; in addition to this, the rectum was attached to the pelvic peritoneum on either side, as high as the promontory, by silk sutures, in the hope of getting support from many attachments to the peritoneum.

In the female, in addition to closing the posterior cul-de-sac, the rectum was sutured to the posterior surface of the vagina and uterus, and a ventral fixation done.

It is true that in closing the posterior cul-de-

sac, in this way, one is probably suturing nothing but peritoneum, and therefore does not feel that the results can be very permanent. It is very necessary, therefore, to make every effort possible to prevent recurrence. In our cases the posterior cul-de-sac was closed and the rectum attached to the pelvic peritoneum as high as the promontory. Moschcovitz simply closes the cul-de-sac.

Bardenheuer closed the posterior cul-de-sac and attached the mesentery of the rectum to the pelvic peritoneum from right to left.

Quénu and Duval closed the posterior cul-de-sac, then sutured the rectum to the posterior surface of the bladder or vagina on the right, then across to the left side of the pelvis, where a slit was made in the peritoneum over the psoas, and the sigmoid sutured to the edges and to the iliac fascia beneath. The value of this procedure is, we believe, overestimated by them, as it is impossible for the sigmoid sutured in this way to exert any pull upon the lower portion of the rectum. It is, we believe, an excellent way of making the closure of the cul-de-sac more sure.

Quénu states that other operations, such as the Delorme-Juvara, or the Tiersch, may be necessary adjuncts to their operation.

It is, we believe, important in many of these cases, especially the large prolapses, to do something else than closure of the cul-de-sac, to aid in the support. At times removal of mucous membrane with the cautery will assist. In many we are convinced that posterior rectopexy will be of great value. While the giving way of the posterior attachment is not the cause of prolapse, the posterior attachments are loosened and pulled down late in the course of the prolapse. Fixation, therefore, of this portion of the rectum must be of some value in holding up the rectum.

In closing the posterior cul-de-sac, it must be remembered that the anterior wall of the rectum is well stretched, and in order to prevent this portion from prolapsing, it must be drawn well up in the pelvis by a guide suture placed as low as possible into the rectum, and this portion fixed as high as possible. While the dangers of closing the posterior cul-de-sac, that is, injury to the ureters and to the great vessels, may seem considerable, we have had no complication in about twenty cases.

As to the operation for rectocele and prolapse of the uterus, the operation is identical in every detail to that for prolapse of the rectum. We do not believe it necessary or advisable to do an abdominal operation for every rectocele, for our present methods are satisfactory. In large rectocele, and in smaller ones, when the abdomen is opened for some other purpose, the closure of the cul-de-sac is rational, and we believe, essential, to prevent recurrence in many cases.

In all cases of prolapse of the uterus in virgins, there is, we believe, a deep posterior cul-



de-sac of the congenital type. What other conditions there are to cause the prolapse, we do not know. The rational procedure in these cases would seem to be closure of the deep cul-de-sac, the one condition present in all cases, in addition to ventral fixation. Not only do we believe this essential for the permanent cure of these cases, but we believe it necessary to prevent prolapse of the rectum or vaginal hernia later in life.

W. A. Freund, recognizing the relation of the deep cul-de-sac to prolapse, inverted the uterus into the cul-de-sac and sutured it to the sacrum.

In cases of prolapse of the uterus in multiparae, while we believe that stretching of the fascial supports has more to do with prolapse than deep cul-de-sac, we believe that closure of the cul-de-sac will lead to much better results. If the operator will make pressure downward in the cul-de-sac against the posterior wall of the vagina, he will see at once the great pull which can be exerted upon the uterus. If he will then close the posterior cul-de-sac and make pressure upon that, he will, we are sure, be convinced as to the value of closing the cul-de-sac in these cases. If one does not believe in its efficacy in prolapse of the uterus, the closure should be made to prevent the possibility of prolapse of the rectum and posterior vaginal wall.

While closure of the posterior cul-de-sac by purse-string sutures may seem to have little strength, its great value lies in the fact that the closure throws the weight of the intestines forward onto the bladder, symphysis, and anterior abdominal wall, when the patient is in the upright position, as pointed out by Dr. Edward Reynolds, while the deep cul-de-sac allows the weight of the intestines and pressure to come upon the anterior rectal wall or posterior vaginal wall.

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## THE EFFECT OF ALCOHOL IN THE RATE OF DISCHARGE FROM THE STOMACH.

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[From the Laboratory of Physiology in the Harvard Medical School.]

THE methods employed to determine the rate of discharge of the gastric contents into the intestine have in the past been so unreliable that judgments based on them are not worthy of great credence. The results have been expressed in terms of "gastric motility," a rather vague expression which properly means the activity of the stomach wall in muscular contraction. Gastric peristalsis is only one of the elements of gastric discharge, however, because peristalsis is

obviously ineffective if the pylorus is held tightly closed. Thus there may be a high degree of "gastric motility" with no discharge, as, for example, in pyloric stenosis. In spite of its rather loose employment, the term "gastric motility" has probably in most instances been intended to signify the efficacy of the stomach as an organ discharging its contained food.

Some previous observers have stated that alcohol in "moderate" doses increases gastric motility, whereas greater quantities or concentrations have the opposite effect. This is the testimony, for example, of Klemperer<sup>1</sup> and of Kast.<sup>2</sup> Others have declared that its influence is solely as a depressant,<sup>3</sup> and still others have claimed that it has a stimulating effect.<sup>4</sup> Because of these differences of testimony it seemed worth while to seek further evidence regarding the effect of alcohol in the rate of gastric emptying.

The method used was that first devised by Cannon.<sup>5</sup> Its reliability has been substantiated by other investigators, especially by workers in Magnus's laboratory of pharmacology in Utrecht. In brief, the procedure was as follows: Medium sized, quiet cats, deprived of food for 24 hours, were fastened to a holder and fed through a stomach tube attached to a syringe, 25 cc. of mushy potato to which had been added 5 grams of bismuth subcarbonate. If the cats had eaten within 24 hours before the feeding, the rate of discharge was apparently slowed. Fully 25 cc. should be given at each feeding—an amount which causes the stomach in most cats to cast about the same size of shadow. In a few animals the stomachs seemed dilated; and 25 cc. of the potato-bismuth mixture left light areas here and there, as if the organ was not filled. Both peristalsis and the rate of discharge in these animals, however, were normal. The consistency was, so far as possible, uniform—the potato was mashed till of fine, soft consistency and then made mushy by the addition of water, and also of alcohol.

After being fed the animal was immediately released. X-ray observations of the gastric and intestinal shadows were made first at the end of a half-hour, then at the end of an hour, and thereafter hourly until four hours after the feeding. All observations were fluoroscopic, but records were made by tracing on translucent paper the shadows of the intestinal contents. As explained by Cannon, with proper precautions to avoid overlapping of shadows, and with due care in making the tracings accurate, the aggregate length of the shadows in the successive records may be utilized to indicate the rate of gastric discharge.

I first tested the method and accuracy of it by making observations on six cats fed the potato-bismuth mixture, and then the addition of alcohol. The following figures represent the aggregate length of the shadows of the food masses in the small intestine in these cases at the times indicated, are the results secured:



Hours After Feeding.	$\frac{1}{2}$	1	2	3	4
March 6—Cat 1....	12.5	24.0	41.5	20.0	13.5
March 6—Cat 2....	11.0	23.5	38.0	18.5	11.5
March 25—Cat 3....	19.5	25.0	41.2	24.5	18.0
March 25—Cat 4....	10.7	27.5	37.4	30.0	23.0
March 25—Cat 5....	17.0	22.4	39.0	24.0	19.5
March 25—Cat 6....	14.0	29.0	42.0	40.0	35.0
Average.....	14.0	24.2	39.5	26.	20.

No more than six cats were observed in this test series because the figures from the different animals agreed so well and because the average figures obtained by me were so near those obtained by Cannon (14, 24, 39.5, 26, and 20 cm. as compared with Cannon's 10, 31, 42, 25, and 21.)

In the experiments with alcohol the commercial 95 per cent. alcohol was employed, though in some of the tests a lower percentage (37 per cent.) was made by dilution with distilled water. In order to avoid loss by evaporation the alcohol was always added to the potato-bismuth mixture just before it was fed to the animals. It was added in two strengths—6 cc. of 37 per cent., and 5 cc. of 95 per cent. The latter combination was less cohesive than the former, and there was a tendency for fluid to separate out from it. It was stirred thoroughly just before being put in the syringe, and the syringe was emptied at once.

The weaker mixture (6 cc., 37 per cent., or about 0.7 cc. per kilo) produced no striking symptoms. There was occasionally a slight unsteadiness in the feet, or perhaps some increase in irritability, as manifested by greater excitement while on the holder and under observation. But this was hard to judge. The stronger mixture (5 cc., 95 per cent., or about 15 cc. per kilo) rapidly caused extreme intoxication. A staggering gait, which appeared soon after the feeding, was followed by quietness, and later, after an hour or two, by stupor. The stupor was accompanied by shallow and, as a rule, slow respiration. In no case did an animal die from the intoxication.

The rate of passage from the stomach of the potato-bismuth mixture to which 6 cc. of 37 per cent. alcohol had been added is shown by the following figures and also graphically by the dashline in Fig. 1:

Hours After Feeding.	$\frac{1}{2}$	1	2	3	4
March 4—Cat 1....	22	38	62.5	50	38
March 11—Cat 2....	22.5	39	49	45.5	34.5
March 11—Cat 3....	25	39	58	45.5	43.5
March 17—Cat 4....	18.5	34	48	39	28.5
March 17—Cat 5....	20	28	48	37.5	37.5
March 17—Cat 6....	19	35	48.5	36.5	33
Average.....	21	35.5	52.5	42.5	36

Like the normal records for mashed potato these records show a maximal number of centimetres of the food in the intestines at the end of two hours, but the maximum number is 52.5 instead of being in the neighborhood of 40 cm. The increase is notable even at the end of a half hour; 21 cm. is 50 per cent. higher than the

average figure for normal conditions (14 cm.), and the figure for an hour is likewise about 50 per cent. above the normal. This relatively small amount of alcohol, therefore, has distinctly an accelerating effect on the rate of gastric discharge and produces a higher maximum than the normal.

I noticed that the gastric peristaltic waves were deep and vigorous. In most cases at the end of three hours no residue remained in the stomach.

When the stronger alcohol (5 cc. of 95 per cent.) is added to the potato-bismuth mixture the aggregate length of the food-masses in the intestines at the times designated was as follows (see also the dotted line, Fig. 1):

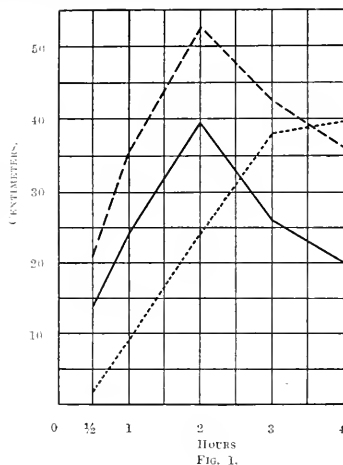


FIG. 1.

Hours After Feeding.	$\frac{1}{2}$	1	2	3	4
March 9—Cat 1....	0	0	25.5	26.5	43
" 2....	4.5	20	22	28.5	29
" 3....	3	5.5	23.5	40	44
" 4....	0	16	38.5	46.5	45.5
April 3 " 5....	0	0	0	15.5	25.5
" 6....	0	6.5	22.5	32	29
" 7....	0	0	28.5	47	38
April 10 " 8....	0	14	23.5	41	43
" 9....	0	12	28.5	40	43
" 10....	12	17	23	39	50
" 11....	0	6	27	50	45
Average.....	2	9	24	38	39.5

As the figures show, eight of the eleven animals reveal no gastric discharge at the end of a half-hour, and in three nothing had left at the end of an hour. In four other cases on which observations had to be stopped because of a breakdown of the apparatus, three had no gastric discharge at the end of a half-hour, and the fourth had only 5.5 cm. of intestinal content. There is a good deal of variation in the different cases, but the average figures show a slow initial discharge and a gradual rise to a maximum at the end of three or four hours.



These results are in contrast to those obtained either under normal conditions or after giving a smaller amount of alcohol (see Fig. 1). Peristaltic waves when evident were shallow and feeble, and in some of the animals there was present in the stomach at the end of four hours a considerable amount of food.

Cannon has brought forward evidence that gastric discharge is normally dependent on the development of an acid reaction in the contents near the pylorus and a subsequent interplay between effects of acid on either side of the pylorus, acid on the stomach side opening and on the duodenal side closing the orifice.<sup>1</sup> It has been observed that moderate amounts of alcohol stimulate the secretion of gastric juice.<sup>2</sup> The more rapid expulsion of gastric contents when the weaker alcohol was used may have been due not only to a more vigorous peristalsis, but also to a more prompt acidulation of the contents. The retardation of the output when the stronger alcohol was employed was likewise, in all probability, due to effects on both peristalsis and secretion. The profound influence of the stronger alcohol on the central nervous system indicates that the nerves of the gastric wall, and possibly also the muscle fibres, were similarly affected, and the weakness of the peristaltic waves (when any were seen) supports that supposition. Pavlov has shown that strong alcohol causes an abundant secretion of mucous, neutral or faintly alkaline in reaction.<sup>3</sup> On the basis of an acid control of the pylorus, therefore, as well as on the assumption of an intoxication of the gastric neuromusculature, it is easy to understand how the stronger alcohol mixed with the food produced so marked a slowing of gastric discharge as was seen in these observations.

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- <sup>3</sup> E.g., Gluzinski: *Deut. Arch. f. inn. Med.*, 1886, xxvii, p. 405.
- <sup>4</sup> Branton: *Disorders of Assimilation, Digestion, Etc.*, London, 1904, p. 147.
- <sup>5</sup> Soliman: *Textbook of Pharmacology*, Philadelphia, 1908, p. 413.
- <sup>6</sup> Cannon: *Am. Jour. of Physiol.*, 1904, xii, p. 388.
- <sup>7</sup> See Cannon: *Am. Jour. of Physiol.*, 1907, xvi, p. 282.
- <sup>8</sup> See Chittenden, Meidel and Jackson: *Am. Jour. of Physiol.*, 1898, i, p. 164.
- <sup>9</sup> Pavlov: *The Work of the Digestive Glands*, London, 1902, p. 168.



## BLOOD TRANSFUSION IN THE GREAT WAR.\*

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IN military, as well as in civil surgery, blood transfusion holds an important position. It is accepted by most surgeons to be the best treat-

ment for hemorrhage and surgical shock. I wish to emphasize the value of blood transfusion in severe secondary hemorrhages, associated with septic gunshot wounds, so commonly seen in military surgery.

During our service at this base hospital in France, several severe secondary hemorrhages were encountered, usually from infected shrapnel wounds of the extremities.

These patients had lost a good deal of blood, at the time of the initial injury, and as a result, had a low percentage of hemoglobin. They presented the pale, sometimes yellowish color of anemia, with the anorexia and general debility which would be expected in such cases. The temperature was subnormal, or slightly elevated, with more or less rapid pulse, of poor quality and volume, due to lowered blood pressure.

Secondary hemorrhages often occurred spontaneously, or on the removal of gauze packing in wounds near, or involving the main blood vessels. After repeated losses of blood, particularly in amputations of the arms or legs, the patient's blood appeared very watery, not tending to coagulate. The granulation tissue was very pale and boggy, all the more so when hypochlorous solution was used as a dressing. The bleeding point sometimes could be snapped, and tied, more often a general, continuous ooze persisted, despite gauze packing.

Severe hemorrhage repeatedly occurred from the use of more or less rigid, large, rubber drainage-tubes, which had been put in at the front, either spontaneously, from erosion of the blood vessel walls, or on the removal of the drain. Large, pliable, cigarette wicks of gutta-percha tissue, wrapped around gauze, were mainly used by us, for drainage, in these infected wounds, involving areas where there were blood vessels of any size.

The general routine treatment for shock and hemorrhage was carried out; the patient was kept warm with heaters and blankets, while morphine sulphate, one-quarter of a grain, subcutaneously, every four hours, as needed, obtained rest and quiet. The foot of the bed was elevated, if the pulse was high. If there was no vomiting, nourishment in the form of eggnogs, custards, milk, champagne, or the less valuable soups, meat extracts, etc., was prescribed freely. In case of nausea, enemata of twenty per cent. glucose, of six ounces each, were given.

Normal salt solution, in lieu of blood, or in conjunction with blood transfusion, may be given subcutaneously, usually under the breast, although the intravenous method is quicker. This raises the arterial tension, and replaces the lost fluids of the body tissues. Too much fluid should not be injected, because it may overtax the heart; furthermore, salt solution does not increase the coagulability of the remaining blood. Rectal tap water may be given drop by drop, or in the form of enemata.

Many of the English medical officers insisted

\* Read at a meeting of the East Boston Medical Society, September 29, 1916.



that blood transfusion had no advantages over normal salt solution, and they placed much stress on the possible occurrence of hemolysis, and the transmission of venereal, or other disease, to the recipient.

Any of the many hemolysis tests may be made, if one has the available time and apparatus. If the result is negative, well and good; but if positive, hemolysis may occur, although it must be borne in mind that the test is made under very abnormal conditions, and the reverse of the test may take place in the body.

The Wassermann test, with a negative history and physical examination, may rule out syphilis, but in our hospital, few patients had had a Wassermann test, because convoys were coming and going continually, so that there was little time or opportunity to make them.

The following typical emergency cases had neither hemolysis or other blood tests made, on account of lack of time and facilities. Healthy-looking donors, who denied having had venereal, or other disease, were accepted, and small amounts of blood were transfused by the indirect, vein to vein method. The Kimpton-Brown two hundred and fifty cubic centimeter glass tubes were used, coated with Vincent's stearin, paraffin and vaseline mixture, consisting of one part of stearin to two parts each of paraffin and vaseline.

If the patient shows no evidence of hemolysis, repeated half-pint doses may be given.

Sterile water or normal salt solution may be used as a coating for the tubes, but the clotting of blood is delayed much longer by the paraffin mixture.

Blood transfusion was done in the following case, both for repeated hemorrhages and to enable the patient to stand the shock of amputation.

Lance Corporal G. F., 2765, of the Fourth Gordon Highlanders, twenty-two years of age, was admitted to the Twenty-second General Hospital on May 3, 1916. He received multiple gunshot wounds of the right leg, on May 1, 1916, while in the front line trenches, and on transfer to the Casualty Clearing Station, he collapsed from loss of blood and shock. The femoral artery and vein were tied off, just above Hunter's canal, where they were injured. On May 3, 1916, he was transferred to the ambulance train, and admitted to this hospital at 10.30 p.m., in Ward A2.

May 4, 1916. Dressings removed, and septic lacerated wound eight inches long on inner aspect, right upper leg, found packed with gauze. Similar deep wounds six inches long, on anterior and posterior aspects of right lower leg, also packed with gauze. The gauze was removed from the wound of the upper leg, and chlorinated soda dressing applied. The packing was removed from the wounds of the lower leg, resulting in profuse hemorrhage from both wounds, not controlled by packing. The anterior and posterior tibial arteries were tied, after enlarging the wounds, and a chlorinated soda dressing applied. Eighteen ounces of normal salt solution were given subpectorally.

Multiple septic shrapnel wounds of the back and loins were dressed with chlorinated soda solution.

The general physical examination was negative, except for marked anemia.

May 5, 1916. Right leg cold, evidently no circulation of blood. General condition poor. Urine negative. Patient takes fair amount of nourishment.

May 6, 1916. Right leg blue, mottled, cold. No pulsation of dorsalis pedis artery. Wounds very septic, discharge foul, despite frequent dressings. It was thought advisable to amputate at mid-thigh, by the surgeon-in-chief, Dr. W. E. Falkner.

With his consent, in order to combat shock, and prevent further bleeding, two hundred and fifty cubic centimeters of blood were transfused by me from Private S. H., a bomb-thrower of the Twelfth King's Liverpool Regiment, who generously offered his blood for his comrade.

Local anesthesia, with one-half per cent. novocain, was used, after the antecubital fossa and surrounding skin had been shaved, scrubbed with soap and water, and alcohol. One inch of the median basilic vein of both donor and recipient was isolated by blunt dissection with scissors, after incision of the skin along the anesthetized area. Two strands of catgut were slipped under the vein of each patient, one to control the flow of blood, and the other to tie off the vein, proximally for the donor, and distally for the recipient.

We do not like to use a tourniquet, as the assistant may forget to remove it, in which event no blood can be forced past it.

The veins are opened by sharp scissors, or knife, cutting half way through them, the flow of blood being controlled by an assistant lifting gently on the catgut strand. A gauze sponge, moistened with salt solution, is placed over the recipient's wound, until the blood is transferred from the donor. The sterilized tubes, coated with the aid of an alcohol lamp, or Bunsen burner, with the paraffin mixture in aseptic hands, is inserted in the donor's vein pointed away from the heart. His blood pressure, aided by flexing and extending the fingers, fills the tube with blood. If difficulty is experienced in inserting the tube, small right-angled forceps or little hooks make useful vein openers. If the blood does not flow readily, altering the position of the tip of the tube facilitates the flow, for the tip may be pushed against a valve in the vein, or against the vein wall too tightly.

When the desired amount of blood is in the tube, it is removed from the vein, and the assistant lifts the catgut gently, stopping further flow. Care should be taken to prevent loss of blood from the tube, by holding one finger over the cork stopper, which falls out readily if the tube is tilted to one side, and placing another finger over the right-angled branch of the tube, during transfer to the recipient. The tube is inserted in the vein toward the heart, and a sterilized cautey bulb is used to drive the blood in slowly by air pressure. Air embolism is to be avoided, by removing the tube from the vein before all the blood has been driven out. The veins are tied off doubly, and excised between ligatures, and the skin sutured.

This transfusion brought the patient's pulse down to 100, improved its quality, and gave a pink color to his cheeks.

A tourniquet was then applied to the right upper leg, and a mid-thigh amputation, by transfusion, was quickly done under primary ether. The flaps



were not sutured, the blood vessels were tied, and chlorinated soda dressing applied. One pint of salt solution was given subpectorally.

The patient withstood the shock of the operation very well, and had no more hemorrhages.

Three days after operation, he developed a virulent streptococcus septicemia, as shown by blood culture. He was given one hundred cubic centimeters of one-half per cent. Eusol solution, intravenously, without effect one way or another. He ran a septic temperature, and died suddenly on the fifth day after operation. No autopsy.

The donor of this transfusion was chosen particularly, because he had a healing granulating wound of the back, caused by shrapnel, and it was thought that his blood would contain antibodies favorable for the recipient.

The following case is a typical one of secondary hemorrhage. I demonstrated this method of blood transfusion at Canadian Number One General Hospital, on the invitation of their surgeons.

The patient, Lance Corporal W. E. S., 1288, of the Tenth Royal Fusiliers, age thirty-three, was admitted to that hospital two days previously, with amputation of the right lower leg, for gas bacillus gangrene, and gunshot wounds of the left hip and knee. He had previously had several severe hemorrhages from his wounds, and he was very anemic. Two hundred and fifty cubic centimeters of blood were transfused from Private L. J. S., 21299, of the Eighth Border Rifles. The recipient had two septic wounds of each elbow, involving the median basilic and median cephalic veins, due to salt solution being injected intravenously at the front, so we had to use the cephalic vein high up in the upper arm.

The patient's general condition was improved, and he had no more hemorrhages. Three weeks later, I saw both donor and recipient, and both were doing well. The donor in this case was admitted for bronchitis.

The blood of a member of the patient's family is preferable to a stranger's blood, but hemolysis may occur when two children of the same parents are transfused, so one need not hesitate about using a healthy stranger's blood, in small, and if necessary, repeated doses.

Hemolysis is rare, and even if it does occur, a small amount of blood, as half a pint, is not overwhelming. If no hemolysis occurs, that amount of blood may, and usually does, stop further bleeding, and under favorable conditions the dose may be repeated, if indicated.

The transfusion of blood not only tends to stop hemorrhage, but at the same time furnishes a highly concentrated form of nourishment, and in my opinion should be employed more frequently.

## UNDESCENDED TESTICLE IN CHILDREN.\*

By C. G. MIXTER, M.D., BOSTON.

THE testicle normally descends into the scrotum during the eighth month of intrauterine life. As it passes from the abdomen down the inguinal canal to the scrotum, it lies in a process of peritoneum, the processus vaginalis that becomes obliterated by fusion of its surfaces, leaving a closed sac at the lower end in which the testis lies, the tunica vaginalis. If, however, the testicle fails to descend, fusion does not take place. The undescended testicle, therefore, is accompanied by a congenital hernia. Though merely a matter of degree, the undescended testicle can be described for convenience as lying intra-abdominally, within the inguinal canal or at the external inguinal ring. The scrotum is always shrunken and rudimentary.

In performing any plastic for the relief of this condition, the essential factor is to obtain a sufficient length of cord to permit the testicle to rest easily in the scrotum without tension. It is much easier to secure sufficient length of the vas than of the spermatic vessels. For this reason complete section of the spermatic vessels has been advised by Hegan in cases where the testicle cannot be brought readily down into the scrotum. The accompanying vessels of the vas he considers will suffice to nourish the testicle.

In the past 3 years, 30 operations have been performed for the relief of this malformation at the Children's Hospital. In 7 cases the condition was bilateral; in 9, the right, and in 7, the left side was affected. In 3 cases the testis was intra-abdominal. In 19, it lay within the inguinal canal, and in 8 cases it was just outside the external inguinal ring. In 2 cases, atrophy was noticed at the time of operation. In 1, the testicle was enlarged and thought to be tubercular, and there was an accompanying tubercular peritonitis. The age at operation was: under 2 years, one case; 20 months old; between 2 and 6 years, ten cases; between 6 and 12 years, 12 cases.

The late result of operation was ascertained in 26 instances—4 cases failed to report. The two cases in which atrophy was noted at operation, showed no improvement in the development of the testicle, although the organ remained in the scrotum. There was atrophy in 8 cases following operation. Interference with the enervation of the testicle has been suggested as a cause of atrophy following operation, but nothing to substantiate this view could be deduced from the operative records of these cases. The age at operation had no bearing on the occurrence of atrophy, it being no more frequent in the younger group than in the older in this series. The one factor present in every instance where atrophy occurred, was an interfer-

\* Read at a meeting of the New England Branch of the American Urological Association, held in New York, 1915.



ence with the spermatic circulation at operation.

These cases can be divided into 3 groups; in one, all the spermatic vessels were cut at operation to facilitate the placing of the testicle in the scrotum. In the second, a portion of the lesser vessels were divided and the 3 or 4 main trunks were left. In the third, the vessels were left intact—the latter group comprises 15 operations. Of 14 cases reporting there was no occurrence of atrophy following operation. There were 5 instances of partial division of the vessels. One case did not report and in one case there was post-operative atrophy. The vessels were completely divided in 9 cases; 7 cases reported and in every instance there was marked atrophy. In all the testicle was soft and no larger than a bean. At one operation the testicle could not be brought down and was replaced within the abdomen.

There were 4 cases of bilateral undescended testicle in which section or partial section of the vessels had been performed on one side and the vessels left intact on the other side. Three reported and in every case the testis was atrophied on the side where the vessels were cut; while where the vessels were left intact, the testicle developed normally. In the fourth case the time since operation has been too short to make the observation of value.

At the risk of repeating what is already familiar to you, with perhaps the exception of certain minor points of technic, I will briefly outline the steps of the operation I have found will best conserve the spermatic vessels and give adequate length to the cord.

A liberal hernia incision is made and the external oblique aponeurosis is split. The hernia sac is separated from the cord and a tunica formed about the testicle from its lower end. The testicle should not be handled unless covered by its tunica. Trauma of the unprotected testicle is the usual cause of the excessive swelling that sometimes follows this operation. A bed is prepared in the scrotum. The hernia sac is transfixed and tied at the internal ring and excised. Traction is made by the tie on the peritoneal stump and by blunt dissection, the peritoneum covering the vessels as they pass upward and backward is freed along the posterior abdominal wall. Preferably this is done by finger dissection. By gentle pull on the testicle, the fibrous bands holding the vessels are brought into view and torn across. The separation is carried on as far as the finger can reach. All of the cremaster muscle and fibrous tissue is excised, leaving simply 4 or 5 spermatic trunks in the inguinal canal free from the vas. The latter is similarly freed from peritoneum where it turns downward and backward into the pelvis, and the transversalis fascia, whose upper margin forms a pulley over which the vas hooks, is incised downward as far as the deep epigastric artery. This will unquestionably lengthen the vas sufficiently. Should the vessels still prevent the testicle from lying without tension in

the scrotum, gentle traction on the testicle will show which of these trunks are under the greatest strain and one or two of these may be tied and cut. A temporary suture is then placed through the tunica and passed out through the bottom of the scrotum and clamped to the operating sheet to hold the testis in position during closure. Purse string sutures around the upper part of the scrotum are unnecessary. The hernia is repaired without transplantation of the cord.

During the last 3 years, I have followed this procedure in 23 operations. The testicle was brought down into the scrotum without sacrificing the spermatic vessels in 17 instances. One case has not reported, in one atrophy was noted at operation and still persists, and two operations have been done within the last month and should not be enumerated. In the remaining 13 cases there has been no atrophy and the testicle was found movable and in the scrotum at examination. In 4 instances partial resection of the vessels was done. Atrophy was found at operation in one; the condition is unchanged. Atrophy followed operation in one case. In the other two instances there has been no atrophy; the testicle having been intra-abdominal in one of these. In two cases the spermatic vessels were completely divided. I do not now consider that the procedure was essential or justifiable in these cases. Both show marked atrophy.

The results obtained in the younger children in this series were as good as in the older children, both in regard to the position of the testis in the scrotum and in the presence or absence of atrophy.

Preferably operation may be performed at any time after 3 years. Should beginning atrophy from pressure be noted, however, early operation should be advised. If the hernia gives rise to symptoms a plastic can be done in infancy and a good result may be expected.

I have considered the results in these cases satisfactory as long as there was no atrophy and the testicle remained in the scrotum, without attempting to differentiate between the instances where the organ lay in the lower or upper quadrant of the scrotum, as in either position it was not exposed to trauma or subject to pressure. In no case has there been a recurrence of the hernia.

The testicle in childhood requires a free circulation for normal development. A plastic operation by which the undescended testicle is placed in the scrotum without impairment to the circulation will be followed by normal growth. Where partial resection of the spermatic vessels is necessary, atrophy may or may not ensue. Complete section of the spermatic vessels has been invariably followed by atrophy in this series of cases, the blood supply from the artery of the vas being insufficient to nourish the developing testicle. This operation should be resorted to in children only under exceptional circumstances.



# THE MECHANISM OF THE PROTECTION AFFORDED BY THE DRAINAGE OF PROSTATICS AS A PRELIMINARY TO OPERATION.\*

## A CONSIDERATION OF THE PRODUCTION OF IMMUNITY.

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No discussion is necessary to establish the now generally accepted view that the eustom of preliminary drainage before operations for prostatic obstruction has been an important factor in reducing the mortality. Much obscurity, however, surrounds the reasons for the benefit thus produced and it is with this subject that we are here concerned. The importance of preliminary drainage is by no means equal in the various classes of cases presenting themselves for operation. It will probably be generally admitted that preliminary treatment, of which drainage is the most important constituent, is most essential in the class which comes to us with the largely over-distended bladder, sometimes stretched to the point of overflow, but in whom infection has not yet occurred. We all of us remember the dreadful mortality which accompanied the attempt to empty the bladder and remove the obstruction immediately upon coming under observation. It is notorious that these cases did badly from the start and died generally with the symptom-complex which we somewhat loosely call uremia. Perhaps the next most lethal proceeding was to operate at once upon those cases with a moderate residual of from 6 to 12 ounces and a still uninfected urine, while immediate operation was least hazardous in those cases with a moderate residual thoroughly infected and best typified by the patients who had for some time been leading the so-called catheter life. The extremes are represented by the over-distended uninfected bladder and the thoroughly infected but regularly emptied bladder enjoying a catheter life.

We shall perhaps approach the question in the most orderly fashion if we inquire what benefits are produced by the preliminary drainage which we now institute, and why these benefits accrue. The effects appear to us to be the result of two factors: 1. Relief of the so-called "back pressure," with the equalization of the kidney circulation thus resulting, and 2. Infection which, though long believed to be chiefly a

cystitis, is now generally regarded as in fact a pyelonephritis. This infection is not absolutely inevitable and there are doubtless a certain number of cases which, under the methods ordinarily employed, we believe to be small, in which the process of emptying the bladder and restoring the equilibrium of the kidney is carried through without infection. This is, however, certainly the exception, not the rule, and we are therefore chiefly concerned with the majority of cases in which infection of a more or less serious degree occurs. It has been our experience that infection is most difficult to avoid in the cases with over-distended, uninfected bladders and that the probability of infection is increased rather than diminished by the presence of the inlying catheter. The patients in whom it is most frequently possible to avoid infection are probably those with a moderate residual, still uninfected, whose urethrae are readily passable to instruments and who can therefore be managed by the process of intermittent catheterization.

Now it must be evident that the relief of back pressure upon the kidney and the infection of the kidney, which so commonly accompanies this process, both will affect the kidney function, and as kidney function is the most accurate measure of the margin of safety which these patients enjoy, we can most accurately estimate the effect of these conditions upon the patient's health by studying its effect upon his renal function. For the purpose of studying the changes in kidney function we have employed the phthalein test and, though recognizing its limitations, continue to regard it as on the whole the most useful measure of kidney function. Lumping together for the moment all the cases with residual urine treated by drainage, whether that residual be large or small, infected or uninfected, drainage produces, generally speaking, a drop in function, an intermediate period in which function remains more or less low, and a return frequently to a point somewhat below the original level but sometimes equaling, or even exceeding, it. (Figs. I, II and III and IV.) The greatest fall in function is to be expected in the cases of recently over-distended, uninfected bladders, while the least reaction is undoubtedly seen in the cases with a moderate infected residual. The very great drops occasionally seen in patients with over-distended, uninfected bladders, we believe to be due to a composite process, part of the drop being due to the relief of pressure, with consequent acute congestion of the kidney, and another perhaps equal amount due to acute pyelonephritis. Some difficulty may be experienced in assigning the proper proportion to each of these factors, but we can arrive at an approximate estimate of it by studying the cases in which only one of these factors is operative. We have been able to study a small group of over-distended, uninfected bladders which were successfully emptied and brought to excretory equilibrium without the interference of infec-

\* Read at a meeting of the New England Branch of the American Urological Association, held on Nov. 30, 1913.



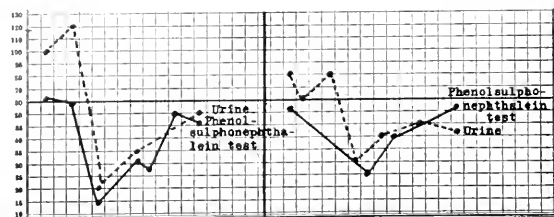


FIG. I.

FIG. II.

Figs. I. and II. copied from Pitcher, showing simultaneous drop in amount of urine excreted and the phenolsulphonphthalein test in patients on constant drainage preliminary to operation.

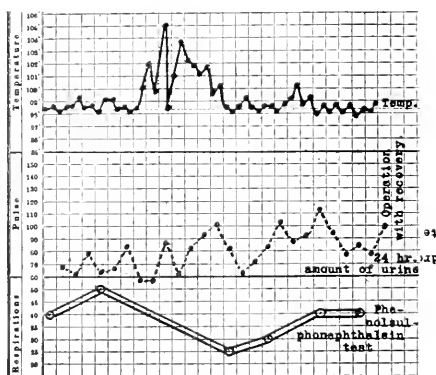


FIG. III. A man of 60. Hospital No. 199448. Diagnosis: Adenomatous prostate with uninfected residual of 14 ounces. Symptoms of pyelonephritis developed during drainage.



FIG. IV. A man of 61. Hospital No. 199551. Diagnosis: Adenomatous prostate with longstanding residual as yet uninfected. Unvaccinated. Pyelonephritis.



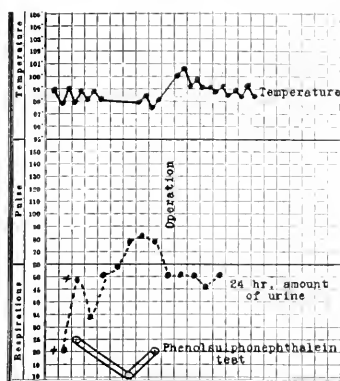


FIG. V. A man of 76. Admitted to the hospital Nov. 8, 1915. Private patient of Dr. Cabot. Diagnosis: Adenomatous prostate with uninfected residual of 18 ounces. Preliminary vaccination.

tion. Such cases are typified by the chart presented in Fig. V. In this case, a careful bacteriological study of the urine showed entire absence of infection from the start to finish. It will be noted that the fall was over 50% but that it never reached very low figures and rather promptly returned to something like the original level. With this we should compare the cases of pure pyelonephritis without organic obstruction, such as are seen in the early months of pregnancy or immediately after confinement. Fourteen such cases are charted in composite Fig. VI. As they entered the hospital

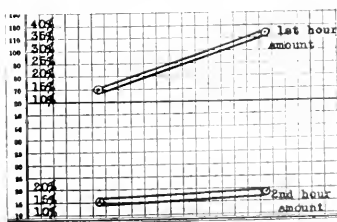


FIG. VI. A composite chart of 14 cases of pyelonephritis in women, all, save four, associated with pregnancy, showing excretion of phenolsulphonphthalein for two hour periods. The beginning of the curve represents the average output of phenolsulphonphthalein during disease. The end of the curve shows the average output at the time of the patients' discharge from the hospital.

with an active pyelonephritis, the low function at the first test may be taken to represent the average effect of the disease, while the rise to time of discharge represents decline of parenchymatous involvement.

With these two factors thus more or less definitely understood it is possible to see why the greatest drop should occur in the over-distended, uninfected (Figs. I and II) and why there may be little or none in the moderately distended in-

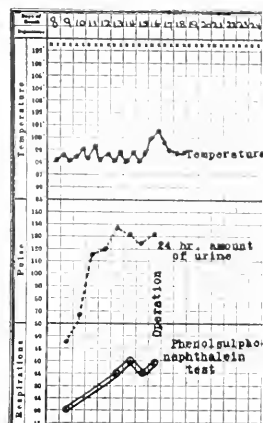


FIG. VII. A man of 66. Hospital No. 189929. Diagnosis: Adenomatous prostate with infected residual. Patient has led a catheter life.

fect (Fig. VII). In the former case, two factors, both tending to reduce kidney function, become operative at somewhere nearly the same time, the congested kidney with diminished function being further submerged by the intercurrent of a pyelonephritis. On the other hand, the patient with an already infected urinary tract is exposed only to the drop of function resulting from what one may call decompression. He is, we believe, protected from an intercurrent pyelonephritis by the immunity which he

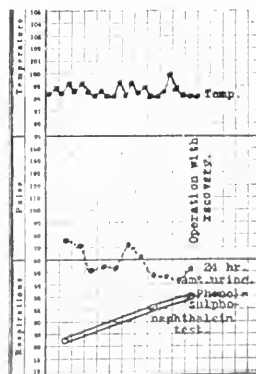


FIG. VIII. A man of 66. Hospital No. 189929. Diagnosis: Adenomatous prostate with infected residual. Patient has led a catheter life.

has established as the result of a previous infection (Fig. VII). This, we believe, accounts for the notoriously better results of emergency operations upon patients leading a catheter life.



We are now in a position to estimate the causes operating through the kidney to produce the high mortality before the days of preliminary drainage. In the worse cases (the over-distended, uninfected) these patients were asked to survive three more or less lethal assaults all of them operating to depress kidney function and attacking them at substantially the same time, namely, decompression congestion, operation and pyelonephritis, with no previously established immunity. Drainage has had the effect of separating these three factors in point of time so that the decompression comes first, the pyelonephritis comes second and these two being survived, the operation comes third. This not only has the eminently desirable result of enabling a considerably larger number of patients to survive but the also not undesirable corollary that should the patient fail to survive the first two catastrophes, he is not added to the burden of the statistic-worshipping surgeon.

Now there is one of these three factors to which less attention has been paid than we believe it deserves, namely, the intercurrent pyelonephritis. The decompression congestion can hardly be avoided, at least to some degree, the details of the operation have commanded the attention of the most eminent, but the important kidney infection has been too much regarded as an unavoidable catastrophe. During the past year we have concerned ourselves extensively with the nature of pyelonephritis and its effect on function. The process which we here term pyelonephritis is that commonly referred to in medical literature as pyelitis. This we believe to be a misnomer, though the pathological material for the formation of an opinion is by no means plentiful, since the disease is not commonly fatal. The term pyelitis has been loosely applied to a group of cases whose chief symptoms are bladder irritation, pus in the urine, fever and varying degrees of costovertebral tenderness. This picture is practically always produced by infections with the colon bacillus, though it may possibly be produced by other organisms. From evidence already presented by one of us (E. G. C.) we believe it to be relatively clear that this is an excretory type of infection, by which we mean that the lesion occurs in the attempt by the kidney to get rid of colon bacilli circulating in the blood. Under reasonably normal conditions this feat is generally successfully performed and the kidney suffers no damage. Under conditions attended by renal congestion successful excretion often fails and kidney infection occurs. We base our opinion that this condition should be regarded as a pyelonephritis and not a pyelitis, largely upon the evidence of the marked depression of kidney function which accompanies it. We see no reason to believe that infection of the renal pelvis alone can produce any such effect on function as is here observed and there is a moderate amount of pathological evidence to show that the lesion is not simply one of the pelvis,

A case under our observation bears directly upon this question. The patient was a "prostatic" with a typical intercurrent kidney infection in which the colon bacillus was reclaimed first from the blood and later from the urine, and who died shortly after operation of hemorrhage and streptococcus septicemia. The kidneys showed a very moderate lesion of the type known as cloudy swelling, most marked in the convoluted tubules, with a still early but microscopically well marked pyelitis. In this patient a previously good renal function was depressed 20 points by the kidney infection, which, nevertheless, left but very moderate evidence of damage. To this might be added several other less fully studied cases whose clinical course entitles us to believe that they had similar lesions.

The striking fact about these cases of pyelonephritis is the amount of the effect on the kidney function as compared with the apparent lesion. In fact they are likely to be passed by the pathologist as substantially normal unless a careful study be made of the tubular area. This discrepancy may be explained by the fact that the phthalein excretion is perhaps carried on chiefly by the convoluted tubules and that a comparatively mild lesion of this area will have relatively striking functional effects. We desire also to draw attention to the fact that the permanent lesion, where such occurs, is chiefly in the renal pelvis where, in persistent cases, a chronic catarrhal pyelitis remains, giving rise to the persistent bacilluria and being the source from which recurrent invasions of the kidney, chiefly in its interstitial portions, occur.

The next important question which we are required to discuss is the mode of entrance of the bacilli into the circulation, having regard only to this particular group of cases. As tending to show that these infections are of hematogenous origin we submit the evidence already reported by one of us (E. G. C.) that blood cultures in these patients with prostatic obstruction on constant drainage are positive for the colon bacillus in a proportion of cases about equal to that occurring in typhoid fever, in which the infection is admitted to be of hematogenous origin. It is further to be noted that positive cultures are much more likely to be obtained when the blood is taken at the onset of the attack and that cultures taken at a subsequent period are more likely to be negative. In these cases it is obvious that the organism is most likely to enter the blood from some portion of the lower urinary tract and that of these structures the prostate is the most probable offender. Examination of the prostates removed from patients who have been on constant drainage shows clear evidence of an acute prostatitis and the large blood supply of this organ is such as to render absorption probable. Moreover, clinically, irritability of the prostate is not infrequently observed at the time of onset of the kidney infection, which at least suggests that it bears a causal relation. Obviously both the



bladder and the urethra may undeniably be sources of supply; the bladder, because it has been decompressed, is congested, frequently infected and not infrequently injured, while the urethra is almost invariably the site of a traumatic urethritis. Which one of these three possibilities is operative in any given case may be difficult to decide.

This briefly expresses our view of the nature of the pyelonephritis which, as we have already pointed out, is the most important avoidable incident of the preliminary drainage in cases of prostatic obstruction. We believe it to be relatively clear that the effect upon the kidney of the decompression is rarely in and of itself a factor of first class importance. The infection appears to us to be the most weighty consideration and we have come to believe that the chief benefit resulting from preliminary drainage in these cases is the immunity to pyelonephritis as a complication of the operation, which immunity is conveyed by the pyelonephritis resulting from drainage. In a word, the chief benefit of drainage to the patient is infection, not because the infection is desirable but because the immunity which therefrom results gives him a security which it has not been possible to obtain in any other way. That this immunity is of short duration seems probable from the fact that patients with a chronic pyelonephritis notably suffer from relapses of the nephritis element at longer or shorter intervals.

If now it is believed that our contention on this point is of substantial soundness the foundation has been laid for the understanding of our further proposition, namely, that it may be possible to produce immunity to pyelonephritis in these patients by a method less violent than the actual production of the disease. It has been amply demonstrated that a considerable degree of immunity to the typhoid bacillus can be produced by what is known as vaccination. The relation between the typhoid and the colon bacillus is one of reasonable kinship and it is therefore at least arguable that they may behave in a somewhat similar fashion. That the problem is far more complicated when dealing with the colon bacillus must be admitted at the outset, since the family of colon is a numerous tribe. On the other hand, it has already been shown that immunity to certain strains of the colon bacillus can be produced both in man and in animals. Our own work upon this subject has been carried on only for a period of six months, but we have been able to satisfy ourselves that in so far as agglutination can be regarded as a measure of immunity we have been able to produce it in our patients. We have worked with single strains, and with a variety of strains combined, and our clinical results to date, though too meagre to be made the basis of dogmatic assertion, appear to have been attended by some measure of success (Fig. VIII). At the outset we confined our efforts to those cases which came to us uninfected and have attempted

in them to produce a protective immunity. More recently we have extended this work to cover the cases already infected, in the attempt still further to raise their immunity to the intercurrent infections which bladder drainage is so likely to invite.

We wish to be clearly understood as presenting this only as the beginning of a piece of work which appears to us based upon sound premises and draw attention to it this time in order that the efforts of others may supplement our own endeavor, should it seem worthy of further consideration. That intercurrent pyelonephritis is for the prostatic a serious catastrophe seems to us clear; that it is in some ways a protective mechanism is at least a reasonable contention. If this protection can be established by the production of artificial immunity, a considerable advance will have been made toward eliminating an important factor in the mortality of operative procedures for the relief of prostatic obstruction.

## Clinical Department.

### PREGNANCY COMPLICATED WITH HERNIA.

By JOHN P. GARDINER, M.D., TOLEDO, OHIO.

STATISTICS show that the percentage of hernia occurring during gestation is very low. Mlle. Komarowsky<sup>1</sup> in her thesis reporting the work of Braun at the Maternity of Vienna, covering a period of 26 years and the examination of 75,659 pregnant women, found only 62 women with hernia, or 0.08%. Miller, in 9,182 pregnant women, found 35, or 0.04%. Alphi at St. Gall in 1,555 cases reports 0.6%. Harbert of Louvain found 1%.

The number of women, whether pregnant or non-pregnant, having hernia, is considerably less than the number of men. The first statistics bearing on this comparison were reported by Mounikhoff in 1836, who showed that women having hernia were about 1 to 4 as many as men. The same proportion was found by Berger<sup>2</sup> in his personal examination of 10,000 cases of hernia, who found the statistics to be: men 6,220, women 2,229, boys 1,213, girls (under 15 years) 305, making 7,443 for the masculine and 2,534 for the feminine sex, a preponderance of a little less than 75% of men over women.

Malgaigne<sup>3</sup> at the Central Bureau in Paris, in 1836, on 2,767 hernia cases, found 2,203 men and 564 women. In 1837, on 2,373 hernia cases, he found 2,884 men and 189 women, about 1 to 4 being the proportion. Jona than Maoready,<sup>4</sup> in his table of statistics for 1888 to 1890, furnished by the Truss Society,



London, reported that he found the proportion 1 to 5 for women compared to men.

The frequency of hernia in women increases from puberty to the climacteric,<sup>5</sup> while in men it remains the same. Hernias which do develop during pregnancy, particularly inguinal or femoral, frequently reduce themselves (Berger, Freund, Schauta). This procedure can be explained as a simple mechanical process. The gravid uterus, in its ascent from the small pelvis, pushes up the intestines and the uterus fills up the gap, unless the gut is adherent. However, after labor the ring is apt to become enlarged and the hernia grows worse during the puerperium, because of the relaxed condition of the supporting muscles. All authors agree as to the frequency with which women, questioned as to the beginning of their trouble, date the beginning of their hernia from pregnancy. The multiplicity of pregnancies very greatly increases the tendency to develop hernias, as was shown by Berger,<sup>7</sup> who interviewed 2,229 women of all ages having hernia and found that 1,871 had had pregnancies to term.

Umbilical hernias, unlike inguinal or femoral, hernias, occur mostly in the first year of life and become more and more rare until at 25 years of age they practically disappear. After this age they increase in frequency. Umbilical hernias are more common to women<sup>2</sup> than to men. When umbilical hernias develop during pregnancy their presence is apt to make severe complications. Of 41 cases seen by de Rycker<sup>8</sup> 10 were irreducible. The danger of strangulation increases as pregnancy progresses, de Rycker's analysis shows no case of strangulation in the first 3 months, 2 in the 4th, and one each in the 5th, 6th, 7th, 8th, and 4 in the 9th month. Pantaloni<sup>9</sup> recommends interference with all umbilical hernias during the first month as the risk of operation is less. The operative mortality of strangulated umbilical hernia is well over 50% (Coley<sup>3</sup>, Manley<sup>10</sup>).

Other hernias, more rarely met with than inguinal, femoral or umbilical, are few in infancy and adolescence and increase in frequency up to 35 and 40 years. Pre- and retro-vaginal hernias are due to pregnancy<sup>2</sup>, pre-vaginal or pudendal being the more common. These are to be reduced if possible, if not, pregnancy should be terminated<sup>7</sup>. Vagino-labial hernia<sup>2</sup> occurs in the inguinal locality. A hernia may contain an impregnated uterus<sup>10</sup>. Hernia of the white line or ventral is virtually in the same class as umbilical hernia.

Of all hernias the inguinal is the most common kind. Macready<sup>4</sup> found inguinal 50.4, femoral 31.6; Berger, inguinal 46.6, femoral 32.7. It was found that the proportion was the same for pregnant women. Komarowsky<sup>1</sup> in 35 cases, 22 inguinal, 4 femoral, 9 diverse. Either side, right or left, is about equally affected.

Inguinal and femoral hernias, occurring during pregnancy, frequently reduce themselves

mechanically as has been mentioned above. Yet, if they do persist and cause pain or distress radical measures should be resorted to. The literature on herniotomy during pregnancy is small; nearly all references are to single case instances. The largest group studied is from Engstrom's Clinic,<sup>11</sup> which comprises 18 cases upon which herniotomy was performed: umbilical 9, inguinal 8, femoral 1. They all healed per primam intentionem. Of the umbilical 2 recurred, one 4½ years after 2 normal pregnancies, and the other, during the next pregnancy.

Fischer,<sup>12</sup> in 1898, employed the Schleich method of anesthesia with success. Cushing, Bloodgood and Bodine, in 1900 used cocaine to good effect in herniotomies. With the advent of novocain combined with adrenalin the necessity of giving a pregnant woman a general anesthetic for herniotomy is done away with.

Of the three cases of hernia which the writer has had occurring during pregnancy and demanding an operation, one was inguinal and two were umbilical.

Mrs. M., aet. 26, Para II, birth of first child was 2 years ago, pregnancy normal and puerperium uneventful. She became pregnant March, 1915. July 5, while coming down stairs carrying her baby, her heel caught on the stairs. With great difficulty she recovered her balance and the effort was accompanied by a sharp stinging pain in the left groin. The pain passed away in the course of a few hours, but she noticed that whenever she was on her feet a long time, an aching pain was felt in the left groin. Early in September, an enlargement, the size of a hazel nut, was noticed and by October it had increased in size and troubled her so that she was practically incapacitated. October 15, under local anesthesia, herniotomy was performed. Recovery was uneventful. December 18, 1915, she was delivered of an 8½ lb. girl. Puerperium normal and has remained well. The cicatrix is firm.

Mrs. K., aet. 36, Para VI, had been pregnant 2 months when she began to notice a peculiar pain about the umbilicus when she lifted heavy objects. Examination revealed an umbilical hernia. In the 3d month an overlapping operation was done under local anesthesia. Recovery uneventful. Pregnancy continued normal, and she gave birth to a 6 lb. girl; puerperium was normal. The cicatrix remains firm.

Mrs. B., aet. 32, Para IV. Since the last child, has noticed a little painful swelling just at the right quadrant of the navel. It hurt her to cough or sneeze. She became pregnant October, 1911. On November 21, she underwent the overlapping operation. Recovery uneventful. Pregnancy pursued its normal course and the patient was delivered of a 9 lb. boy, July 19, 1912. Puerperium normal, no recurrence to date and she has passed through another pregnancy.

It is evident that pregnancy is one of the chief contributing factors in the production of hernia in women. From this study the writer coincides with the admonition of Berger that



every accoucheur should examine for the patency of the bernal orifices, before the recently delivered woman is discharged.

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## Medical Progress.

### PROGRESS IN BIOCHEMISTRY.

BY A. EVERETT AUSTIN, M.D., BOSTON.

#### VARIATION OF THE BLOOD SUGAR CONTENT.

MANY improvements have been made in the methods of blood sugar determination, all of which tend to greater simplicity and are better adapted to the use of the clinic and the employment of smaller quantities of blood. Other investigations have also shown that the amount of sugar in the blood has much greater significance than its presence or its amount in the urine, as being much more closely associated with the sugar building and sugar destroying functions of the body.

Maase and Tachau<sup>1</sup> have performed a number of sugar estimations, employing both the polarization and reduction methods, and have shown a remarkable similarity, with the exception of one case, in the results by both methods. In this instance the amount determined by polarization power was much greater than that of reduction, apparently due to the presence of another carbohydrate in the blood whose polarization power was much greater than that of dextrose but whose reduction was much less. After the ingestion of 100 grams of fruit sugar the reduction values were much greater than the polarization and the greatest difference occurred in a case of icterus.

The estimated glucose content of the blood after the ingestion of 100 grams of levulose was repeatedly greater than the normal limit in the fasting individual.

According to Lauritzen<sup>2</sup>, the estimation of blood sugar acquires great clinical importance in the differentiation of diabetes with hyperglycaemia and diabetes without it; secondly in the determination of the prognosis of those cases where the presence of acetone and diacetic acid in the urine offers us no light concerning the increasing severity of the disease, and last

to control the results of our therapeutic efforts during which repeated determinations of the blood sugar should be made.

While previously we were compelled to depend upon the sugar-free condition of the patient's urine for the results of our dietetic management, we can now determine the foods which produce no hyperglycaemia after their ingestion, when these foods only must be taken by the patient as long as possible.

The avoidance of hyperglycaemia is not only of greatest importance in diabetes, with complications such as neuralgia, gangrene, eczemas and tuberculosis, but also in the uncomplicated mild and severe forms of the disease. It has been distinctly determined by him that hyperglycaemia, though temporary, injures the tolerance of the patient for carbohydrate when suffering from diabetes.

Dresel<sup>3</sup> has investigated the influence of extracts of glands with internal secretion on the blood sugar. The following preparations were employed by him: Extract of the anterior hypophysis, of the parathyroid, of the ovum, of the pancreas, of the intestinal mucous membrane and of the placenta. The injection of 1 cc. of these extracts causes no effect upon the amount of blood sugar; on the contrary, when injected in conjunction with 1-10 mgm. of adrenalin, which alone was able to increase the blood sugar sixteen hundredths of one per cent., the customary increase due to adrenalin was much diminished. This is particularly true of extracts of the ovum, the pancreas and the parathyroid glands. The influence of all these substances was vastly greater than that of the pituitary gland. The other extracts mentioned do not influence in any way the sugar exciting power; apparently, these substances act directly upon the central nervous system.

Brockmeyer<sup>4</sup> publishes a case of Addison's disease, in which the sugar content of the blood remained normal and showed that the severity of the disease bears no relation to the symptom of hyperglycaemia.

#### CHOLESTERIN METABOLISM.

By experiments on dogs with biliary fistulae, Fasiani<sup>5</sup> has shown that the ingestion of food after a period of fasting produces an increase in the cholesterol of the blood and of the bile. This increase is much greater after the employment of foods rich in protein and fats than after carbohydrates. An increase or diminution of the cholesterol content of the bile is always associated with a corresponding increase or diminution of cholesterol in the blood but in the reverse direction. When phloretin is injected a steadily increasing amount of cholesterol is associated with a corresponding decrease of bile cholesterol. Fasiani<sup>6</sup> on the other hand considers that there is a close relation between the cholesterol content of the blood and the bile, and that the liver is saturated with cholesterol.



Henes, Jr.,<sup>6</sup> has made numerous estimations of the amount of cholesterin in the blood in various forms of disease and has come to the following conclusions: Practically all gallstones consist for the most part of cholesterin and the increase in blood cholesterin appears to be the cause of the gallstone formation. When gallstones exist without fever, there is almost always a marked increase of cholesterin in the blood which can be employed for the purpose of differential diagnosis. This increase of cholesterin in the bile is liable to persist even after the removal of the stones, while a cholecystectomy, without removal of the gall-bladder, does not free the patient from the possibility of subsequent formation of stones.

Rothschild<sup>7</sup> has shown by experiments on rabbits that the removal of one suprarenal gland is accompanied by a moderately increased amount of cholesterin in the blood. When both suprarenals are removed a much more rapid and distinct increase of this substance in the blood is noted than by the unilateral operation. Corresponding with the double removal there is an increase of excretion of cholesterin in the bile. The distinction between the effects produced by the loss of one or both suprarenals is not great enough to regard this operation on the kidney as a producer of cholesterin and their significance, then, depends not upon their control of cholesterin metabolism, but upon their content, apparently as a storehouse.

#### PROTEIN METABOLISM.

Protein still continues to be a puzzle as to its disintegration in the digestive tract and its regeneration in the blood. That the different proteins act variously in accordance with their percentages of the various amino-acids is becoming better known, and that some of them are not efficient foodstuffs because they are so utterly unbalanced in these before-mentioned acids, which apparently form the foundation stones of the regenerated albumin molecule. Considerable work has been done by various investigators during the year.

Bornntau<sup>8</sup> has found, by feeding without protein from the vegetable foods, that the chemically proven lesser value of the grain proteins in comparison with that of animal character does not actually exist, if the grain is ground as a whole, since those portions comprising the envelope of the grain contain the missing fraction and are able, when employed with the bolted flour, to replace those amino-acids which are lacking and which make the plant protein fully equal to the animal.

Aberghalden<sup>9</sup> and his associates have shown that much less protein is needed to maintain the nitrogen equilibrium of individuals when potatoes are employed, and this same fact is true apparently of Swedish bread. During a period of ingestion of potatoes, an amount containing 4.5 grams nitrogen was sufficient to maintain the

protein equilibrium of the body. When we withdraw from this the amount of nitrogen appearing in the feces we find that upon an exclusive potato diet a nitrogen minimum of four grams is sufficient to maintain the protein equilibrium.

Zeller<sup>10</sup> has investigated the influence of fat and carbohydrate in the presence of deficient protein upon the nitrogen elimination. Seventy to ninety per cent. of the carbohydrate can be replaced by a caloric equivalent of fat without the nitrogen elimination exceeding the minimum with a pure carbohydrate regimen. For complete oxidation of the fat, the food must contain at least one part carbohydrate to four parts of fat; the urea may be diminished so that it forms only forty per cent. of the total nitrogen. The excretion of creatin and creatinin remains the same whether we employ a carbohydrate or a fat diet. The elimination of neutral sulphur is practically the same and, only when we employ a fat caloric value of ninety per cent. of the total, is increased. The amino-acid and peptid nitrogen behave exactly as the neutral sulphur. The uric acid and purin excretion sinks during the early part of the pure fat period but later with the addition of sugar exceeds the amount determined during the pure sugar period. The increased nitrogen elimination which occurs during the fat period appears to be due to the increased destruction of animal protein.

Cahn-Bronner<sup>11</sup> has shown that by feeding various split products of protein, such, for instance, as that portion of Witte's peptone which is insoluble in water, or the peptone obtained from meat and also its alcohol soluble portion, we may produce an accumulation of albumin in the liver; there are, however, certain factors which may prevent the accumulation of protein in the liver cells even when all the essentials for synthesis are present. No evidence was discovered which tended to show that it made any difference to the liver cells which of the split protein products were fed. In no instance was the parenteral introduction of protein products able to produce an accumulation of protein in the liver. These experiments show clearly that the animal organism is able, by synthesis, to produce protein from the amino-acids.

Grafe<sup>12</sup> has investigated the retention of body protein through the ingestion of ammonium salts and urea in man. In all his five individuals, the addition of ammonium chloride, ammonium citrate, urea or their combinations to a standard protein diet always produced an improvement in the nitrogen balance. Often a distinct minus balance was changed into a corresponding plus one. In all cases a large part of the nitrogen which was retained on the first day was eliminated on the following days with similar additions of nitrogen as during the period of standard diet. In four cases, however, a large amount of the nitrogen was not eliminated but apparently permanently retained. Furthermore, the nitrogen minimum could in this way be



much farther depressed. These instances with the human correspond closely with those of animals, so that they may be applied to all warm-blooded animals.

#### FAT ABSORPTION AND METABOLISM.

Nakashima<sup>13</sup> has investigated the absorption of fat in the colon and rectum. While, after the ingestion of moderate amounts of fat or cream, fat particles appear abundantly in the blood, when examined with the dark field of the microscope, thus proving its absorption, such appearances fail utterly when fat is introduced solely by rectum. When larger amounts of emulsified fat (milk or cream) are introduced into the colon, occasionally they appear, since there is a slight absorption of fat into the blood from the colon. These, however, fail utterly, when before their introduction, the ileum is ligated or cut, just above the ileo-cecal valve. Hence it appears that with rectal enemas of fat, no such absorption appears in the blood as when milk is taken by the mouth. Whether the fat may not be taken up in a dissolved form from the rectum into the blood cannot be determined by means of examination of the blood; furthermore, by physiological examination of the colon after a rectal ingestion of fat, no such appearances of fat absorption appear, as are shown in the active mucous membrane of the small intestine.

The same author has continued his investigations on the absorption of fat from the peritoneal cavity. This occurs in cold blooded animals much more promptly than in warm blooded, while casein is absorbed from the peritoneum much more rapidly than fat. Both fat and casein appear in mice within twenty minutes in the blood and can be detected for almost twenty-four hours. In frogs both substances appear in the blood within ten to fifteen minutes and remain for forty-eight hours. The absorption of suspended lecithin from the peritoneum takes place much more slowly and continues a much longer time while the fragments disappear only after a long period. The fat-absorbing power of the pleural cavity is much less than that of the peritoneum. When the peritoneum is inflamed by chemical substances, the absorption in frogs is almost normal but in mice is fully checked. This absorption of fat and casein from the peritoneum is brought about by the lymphatics without the participation directly of the blood vessels.

According to Helly<sup>14</sup>, the quantitative fat content of the liver and the visible appearances of fat are practically coincident, though there are instances in which these two factors differ. The quantitative amount of fat in the liver shows, between the minimum and maximum, no regular increase or diminution, but certain percentages are much more often favored. Hence, according to the author, the fatty degeneration of the liver is not so much a pathological process as a normal function regulated by patho-

logical conditions of other organs in which an associated activity of the central regulating power may take part.

#### INTERNAL SECRETIONS.

Since the discovery of secretin, efforts have been made to discover the relation between the external and internal secretion of the pancreas. After the introduction of secretin, the pancreas produces an amount of pancreatic juice which exceeds fourfold its ordinary amount.

Loeb and Stadler<sup>15</sup> have investigated the possibility of a stimulation of both secretions by certain substances, to determine whether they are associated with each other or entirely independent. Their conclusion is that secretin produces no influence whatever upon the sugar assimilation, hence they conclude that the external and internal secretions of the pancreas are entirely independent of each other.

Fleischmann and Salecker<sup>16</sup> have investigated the influence of glands with an internal secretion upon purin metabolism. Nucleinic acids, when fed to dogs, were almost quantitatively eliminated in the urine; when, however, pituitrin was given at the same time, the excretion of allantoin was not only lessened but also was much delayed. When, on the contrary, pituitrin was given to animals upon a purin free diet there was a slight increase of the allantoin excretion with a following diminution, although when the animal was allowed to go without any food whatever, this allantoin increase did not occur. Adrenalin, when injected in moderate doses, caused a distinct increase in the allantoin excretion without an increase in the total nitrogen eliminated. When the animals were deprived of the thyroid, the nucleinic acids which were given, were excreted in much lessened amounts. Jodothylin ingestion causes a diminution of the allantoin excretion in conjunction with a marked protein destruction. When the animals were fasting, the ingested purin bases were eliminated in distinctly less quantities, which was interpreted as a retention. Ingestion of excessive amounts of fluid always caused a marked increase in the allantoin elimination.

The elimination of creatin and creatinin in diabetes and nephritides has been carefully studied by Lampert<sup>17</sup>, who found that when a meat and bouillon free diet was given to healthy individuals, the creatinin excretion varied from 0.9 to 2.4 grams per day; creatin was generally not found at all or found in the merest traces (0.02 mgm.). In diabetes the values for creatinin were generally diminished or at least were found at the lowest point of normal values. Creatinin values remain in all cases, with few exceptions, under one gram, though there were very severe cases in which values were often found varying from 1 to 2 grams. In severe forms of diabetes, with excessive acetonaemia, creatin was always found in the urine, and in all instances far beyond the normal amount of 0.2 grams; in two



instances, amounts of 1 to 1.2 grams were found. In mild diabetes, with only traces of acetone, creatin was either absent or was found in the merest traces. In nephritis there was also a diminution of the creatinin output even when there was excellent diuresis and when the activity of the kidney was not diminished. Creatin was found in only one case of marked renal insufficiency and then only in the merest trace. Two cases of diabetes with a coincident interstitial nephritis gave especially low values for creatinin, hence the appearance of large quantities of creatin in the urine of diabetics with acidosis is the result of a pathological metabolism and the diminution of creatinin in the urine of nephritics is the result of renal insufficiency.

#### NATURE OF IODINE IN THE THYROID.

For many years efforts have been made to determine the character of the iodine in the thyroid as well as the laws governing its metabolism. These researches have been continued during the past year with much enthusiasm by various investigators.

Among these, Blum and Grützner<sup>18</sup> found that by far the greater part of the iodine in the thyroid is firmly combined with protein. In addition, a very small fraction may be found which is soluble in acetone and is probably iodide of potash. This amount of iodide of potash was found to be independent of any ingestion of that substance and also present in such animals as had received only milk, rice or meat as food. No constancy of the thyroid iodine content was found, at least in dogs; on the contrary, when iodide of potash was ingested, there was a manifest increase in the combined iodine of the gland. This increase, then, must be due to a physiological action by which inorganic iodine is converted to organic or combined. This process is specific in the thyroid, as it occurs in no other organ of the body. When one thyroid was removed and potassium iodide was given the animal, the amount of iodine in the remaining gland was distinctly increased; when no iodine was given, the remaining gland maintained its iodine content without change, but if it were previously enlarged, the iodine content was found later increased. These findings are not to be interpreted as indicating an internal secretion of iodo-proteins on the part of the gland but intraglandular elimination of the iodine absorbed, much as the antidotal action of the liver with mercury.

The same authors distinguished very sharply between iodine metabolism and iodine secretion on the part of the thyroid.

A systematic elimination of iodine or one which continues for any length of time is never found in the organisms of warm-blooded animals except in the thyroid. The lymph glands associated with the thyroid were always found free of iodine. Other organs of normal animals which were examined contained in a few in-

stances, but irregularly, inorganic iodine, probably derived from the food but never the combined metal. After persistent ingestion of potassium iodide, the presence of iodo-proteins was never detected apart from the thyroid. Hence the combination of iodine with protein must be a specific activity of the thyroid alone.

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## Reports of Societies.

### BOSTON SURGICAL SOCIETY.

(Incorporated.)

#### ELEVENTH MEETING.

A stated meeting of the Society was held on Monday, March 6, 1916, at the Tavern Club, at 8.15 P.M.

Dr. W. P. GRAVES read a paper on the

#### PRACTICAL ASPECTS OF THE INTERNAL SECRETION OF THE OVARIES.\*

Discussion of Dr. Graves' paper followed:

Dr. H. T. HUTCHINS stated that ovarian therapy had not been reduced to any scientific basis of standardization. We can use tablets of ovarian sub-

\* Dr. Graves' paper was published in the August number of the *New York State Journal of Medicine*.







DR. C. L. SCUDDER reported for the committee on end-results of the treatment of infected joints, that a sub-committee had been appointed consisting of Drs. Irving, Walker, Ehrenfried, Miller and Harmer, and that the collection of data was progressing.

The meeting then adjourned.

(Signed)

ROBERT B. GREENOUGH,

Secretary.

## FALL MEETING OF THE NEW ENGLAND BRANCH OF THE AMERICAN UROLOGICAL ASSOCIATION.

HELD AT THE HARVARD CLUB, BOSTON, NOV. 30, 1915.

PRESIDENT, A. L. CHUTE, M. D., BOSTON.

SECRETARY, R. F. O'NEIL, M. D., BOSTON.

### DEMONSTRATION OF CASES, INSTRUMENTS AND SPECIMENS.

#### A DEVICE FOR HOLDING THE HAGNER BAG IN POSITION.

DR. W. W. TOWNSEND: I have a Vermont product which I hesitate to present to this critical audience, but it has been one of great value to me in the retention of the Hagner bag. It is simply a wire frame, the bag being introduced in the usual manner, this clothes-pin wire arrangement is put on to hold the air in the bag. The frame is then slipped over the penis. A piece of gauze is applied at the root of the penis so that the counter pressure against the pubes will not hurt the patient. After the bag is in place the tubular portion is pulled forward and hooked into the hook at the end of the wire, which maintains the traction on the bag very satisfactorily.

#### END-RESULT OF A CASE OF TOTAL CYSTECTOMY.

DR. ARTHUR H. CROSBIE: At a meeting last winter I reported a case of carcinoma of the bladder in which I did a total cystectomy, removing bladder, prostate and vesicles. I have now to report that two months ago the man died of a recurrence. I have brought up the specimen to show again tonight as some of you may be interested in looking at it if you did not see it at the last meeting.

#### SPECIMEN OF A VERY LARGE PROSTATE.

I would like to show a prostate which Dr. Chute took out. This gland was removed from a man 76 years of age who had led a catheter life for four years. The prostate is remarkable purely because it is so large, the total weight being 320 grams.

#### A CASE OF EMERGENCY PROSTATECTOMY FOR HEMORRHOGE.

DR. R. F. O'NEIL, BOSTON: It has seemed to me that the following case presents certain points of interest which make it worth while reporting. The patient was admitted to the G.-U. Service at the Massachusetts General Hospital for severe hematuria. History of urgency, frequency, and inability to hold his urine, for three years. Rectal examination showed a large, smooth elastic prostate. Reflexes normal.

A catheter soon became plugged and the bleeding increased. I then decided to open the bladder suprapubically, check the bleeding, and do a two-

stage operation. On opening the bladder under local anesthesia, the knife plunged directly into a solid tumor which proved to be an enormous median lobe practically filling the bladder. Drainage being obviously out of the question for mechanical reasons, gas-oxygen anesthesia was given, and the median lobe, together with two good-sized lateral lobes, was enucleated, in spite of the fact that I knew nothing of the man's renal condition. There was nothing else to be done. He made a good recovery after a rather stormy convalescence, which included a periurethral abscess, epididymitis, and bronchopneumonia.

#### A CASE OF DIVERTICULUM OF THE BLADDER, AND A CASE OF DILATATION OF THE URETERS SIMULATING BILATERAL DIVERTICULA.

DR. R. F. O'NEIL, BOSTON: These cases are reported together as they were in the ward at the same time and were supposed to have similar lesions. Case I seems to emphasize the error in diagnosis in Case II.

In Case I the cystoscopic findings were borne out at operation. In Case II operation showed that what we had taken for diverticula were the much dilated ureters; the case being one of the rare so-called cases of insufficiency at the uretero-vesical junction. (The condition has been recently described by Kretschmer, Urological Transactions, Vol. ix.) Had we injected more silver solution into the bladder at the time the x-ray was taken, the true condition would doubtless have been discovered.

Case I. The patient, a man of 40, was first seen in the G.-U. Out-Patient Department of the Massachusetts General Hospital. Presenting symptom, frequency of micturition. He had a turbid urine and a residual, without any obstruction. Cystoscopy showed the orifice of a diverticulum on the right not involving the ureter, and more or less trabeculation of the bladder. He was sent into the hospital for operation. The diverticulum was successfully excised, and the patient made a good recovery, although the urine remained cloudy for a long time.

Case II. G.-U. Service, Massachusetts General Hospital, a young man of 20. Fourteen months ago urinary frequency and pain which had recently stopped. Urine cloudy.

Cystoscopy: On one side, in the general location of where the ureter should be, was a round hole resembling the orifice of a diverticulum, which we assumed it to be, with the ureter emptying into it. An x-ray catheter was passed into this and the radiograph showed the catheter curled in a circle upon itself as if it were coiled up in a diverticulum. The ureter on the other side appeared somewhat dilated, but not to the same extent. A radiograph of the bladder filled with argentine solution showed a bulge on either side. On the evidence of this and the previous x-ray, a diagnosis of bilateral diverticula was made. The renal function was, time of appearance 11 min.; 20% in first hour, 15% in second.

At operation, on opening the bladder, the two openings seen through the cystoscope in the general location of the ureters, were found. Catheters passed into these failed to go any distance. On stripping back the peritoneum and exploring the base of the bladder, these were found to be the openings of the ureters which were enormously dilated all the way to the pelvis of the kidney. Although these orifices appeared somewhat abnormal,



their appearance was not such as to cause one to suspect the presence of the tremendous dilatation of the ureters which was found.

DR. GEORGE G. SMITH gave an account of his experiences as Surgeon to Mrs. Depew's Hospital at Compeigne, France, illustrated by lantern slides.

DR. C. G. MIXTER of Boston read a paper entitled,

UNDESCENDED TESTICLE IN CHILDREN.\*

DISCUSSION OF DR. MIXTER'S PAPER.

DR. J. D. BARNEY, BOSTON: There is little that I can add from a clinical standpoint to this good paper, but I thought it would be of interest to look up what material we had on this subject at the Massachusetts General Hospital.

In the card catalogue I found there were 198 cases reported in all ages, and that these occurred singly in 185 and doubly in 13. That seems to bear out the testimony of others that bilateral undescended testicles are quite rare. One hundred and thirty-four of these cases, or 66%, were accompanied by hernia of one or both sides. I understood Dr. Mixter to lay more stress upon the hernia than these records would warrant.

In looking over the literature on the subject I find that in 59,000 or 60,000 cases of hernia in children in the hospitals of New York there were only 137 cases of ectopic testicle.

A good deal of stress has been laid upon the occurrence of sarcoma. In our series there were only three cases, a trifle over one per cent. We found hydrocele in only eight cases.

I do not think it is at all strange that we should get hernia or hydrocele because there is a direct communication between the abdominal cavity and the scrotal cavity. I think it is a little more striking that there are so many who do not have hernia.

In regard to sarcoma I find interesting figures. Out of 182,729 admissions to various hospitals in England and in this country, there were 117 cases of sarcoma of the testicle. Only twelve of these were in the ectopic stage, and only three were of the intra-abdominal type, the others being inguinal in one position or the other. And then strangely enough Dr. Bulky of New York reported two years ago two cases of sarcoma of the ectopic testicle, and found that there were only 59 others reported in the world's literature. This struck me as being quite startling. He came to the conclusion that you might expect sarcoma in one out of every 75 ectopic testicles. My impression was, and I think it is generally supposed, that the ectopic testicle is peculiarly liable to sarcomatous degeneration, but apparently it is far from common.

I would like to ask Dr. Mixter what the indications are for operation on a case of undescended testicle in children. I would like also to congratulate him on his paper.

DR. G. G. SMITH, BOSTON: I think that it should be borne in mind that atrophy occurs in the spermatogenic system, and yet not in the interstitial cells of Leydig which furnish an internal secretion. I believe it has been shown by experimental work that although the spermatogenic function may have entirely disappeared, the cells furnishing the internal secretion are apparently spared.

DR. HUGH CABOT, BOSTON: The evidence submitted by Dr. Mixter, that free division of the veins of the cord in bringing down the testicle in operations for failure of descent results in atrophy of the testicle, is a contribution of first-class importance.

This principle of free division of veins was, I think, first advocated in a thorough-going way by Beyer and was perhaps the most important part of his operation. It has been satisfactorily shown by clinical experience that such a free division can be done without causing necrosis and for this reason it has been assumed that it was free from serious objection. Dr. Mixter's contribution goes far to show that though necrosis does not occur, atrophy does, and should this evidence be confirmed by a larger group of cases, division of the veins as a part of this operation must be finally abandoned.

DR. W. T. COUNCILMAN, BOSTON: In connection with this paper of Dr. Mixter's, I happened to read the other day in the Memoirs of Nathan Smith, which were published by his son, Nathan R. Smith, in Baltimore, the report of one of his operations for hernia in 1823. In this case the hernial mass was very large and solid, and in the course of operation he was much surprised to find in it only a small knuckle of intestine. Outside of this there was a large tumor mass which was composed of a testicle, a hydrocele cyst, with an enormous thickening of the tunica vaginalis. The article contains a picture of the condition.

DR. J. W. KEEFE, PROVIDENCE: I should like to mention another condition and that is the twisting of the testicle sufficient to destroy the blood supply, producing a necrosis of the undescended testicle.

I know of an instance of a child about one and a half years old which had that result. The physician was called, and thought he had an inguinal gland, and he applied ice, and later the swelling persisted and I found it necessary to remove the testicle. Another interesting point about this case was that the father of this boy, when he was a man about 26 years of age, had the same condition, when the late Dr. Maurice Richardson saw the case with me; and he made a diagnosis previous to the operation, that we should probably find the testicle so twisted that the blood supply was interfered with. I have felt that many of these cases are atrophied testicles.

In regard to the fact that sarcoma results, the books have told us that it frequently happens. I recall the case of a doctor some 75 years of age who had enlarged prostate for which I operated, and he had two undescended testicles in the inguinal canal. It may be as Dr. Barney has shown, that we do not find sarcoma of the testicle so frequently as the books have taught us in the past.

DR. G. G. SMITH, BOSTON: I should like to ask Dr. Mixter if he remembers what age the children were who had the atrophied testicles. There were two of them, he said, that were atrophied at the time of operation.

DR. J. D. BARNEY, BOSTON: On the other hand, I recall the fact that in a paper published by McClannan in 1913, it was shown that the spermatogenic function is not done away with as frequently as we supposed. In many cases it was still persistent, as shown by the microscopic sections of the testicles, and in the cases in which it was sup-

\* See JOURNAL, p. 631.



posed that there were no spermatogenic cells, there were plenty of them.

**DISCUSSION CLOSED BY DR. MYTER:** The one point which I wanted to make was that I consider this, the Bevan operation, of complete section of the spermatic veins in children, a dangerous procedure as far as the developmental result goes. I think that if this small series is of any value the fact that every case in which complete section was done was followed by atrophy is pretty striking, to say the least.

On the other hand, in every case reported in which the vessels were left absolutely intact, no atrophy resulted.

I cannot of course speak in any way about the spermatogenic function in these cases.

In regard to the indication for operation on undescended testicles in children, one point is the fact that of this relatively small series two cases showed marked atrophy at the time of operation. Those two cases were out of 30 cases operated on.

I cannot tell you the exact ages of those two children, but my remembrance is about six and nine years respectively. The indication for operation in younger children is, as I said,—in the first place, where there is evidence of a beginning atrophy, and in the second place, where the hernia gives rise to trouble and not on account of the testicle.

I see no reason why the testicle should not be operated on after three years or some age in that vicinity, because I think as good a result can be expected as there can be in older children or adults, and there is less danger of atrophy occurring spontaneously.

**DR. HUGH CABOT** of Boston read a paper entitled:

THE MECHANISM OF THE PROTECTION AFFORDED BY THE DRAINAGE OF PROSTATICS AS A PRELIMINARY TO OPERATION.

A Consideration of the Production of Immunity.\*

**DISCUSSION OF DR. CABOT'S PAPER.**

**DR. W. T. COUNCILMAN, BOSTON:** I have been much interested in Doctor Cabot's paper. A great part of it is outside of my province, but the main point of the paper, as I understand it, is the production of immunity before operation, and this seems to me very interesting. It must make an enormous difference whether in consequence of an operation an infection is produced in an individual previously free from infection and who has no immunity, or whether the infection is produced in an individual who has already acquired a very high degree of immunity. The degree of immunity which these patients sometimes attain seems to me very remarkable. I some time ago performed an autopsy on an old gentleman over seventy, who for over twenty-five years had been accustomed to use a catheter eight times daily. The catheter was carried in his pocket, and he was accustomed to lubricate it with saliva in order to facilitate passage. In the course of his life he had had numerous infections in the urinary tract, in the epididymis and prostate, and most of these parts had become sealed off from the urinary tract by chronic inflammation. There was a constant cystitis of not very high degree. For some years before death there had been no infections, and the general condition of health was good.

At the autopsy I expected to find in the kidneys evidences of old abscesses, a high degree of pyelonephritis, and general atrophy of the kidney. I found nothing of the sort. The kidneys were extremely good for an individual of that age, and there was only a slight degree of thickening of the pelvis.

What Doctor Cabot has said is also in agreement with what many of us are thinking in these days; the very great care to avoid infection, in food, in milk, and by our manner of life, may not be wholly to the good. We are possibly doing ourselves harm by not developing immunity to infection, which can take place only by our acquiring infection; it can easily happen that at some time a malignant strain of some organism may be encountered which in the absence of all immunity may be attended with serious results. Possibly the milk epidemics which have been so severe a few years back, may have been associated with this rather artificial absence of immunity. It seems, however, a very novel thing that the surgeon, whose efforts are directed generally to the avoidance of infection, should deliberately produce it. A second point in Doctor Cabot's paper is in regard to the mode of infection. There is nothing more difficult in pathology than to determine in the first place the point of entry of organisms into the tissues, and secondly the mode of extension of the infection from the primary focus. There are so many possibilities in regard to this. If we take for example the progress of such a disease as tuberculosis of the lung: every channel of infection is called into play, such as blood vessels, lymphatics, the surfaces, etc. In all infections the extension by means of surface plays an important part. The extension of infection along the urinary surfaces is very important, and affords an interesting example of surface extension. The pathologists recognize distinctly two modes of infection in the kidney: the hematogenous or the descending and the urogenous or the ascending. I have thought that Doctor Cabot rather doubts the latter, especially from some rather sarcastic utterances of his with regard to the hypothetical natatory powers of the tubercle bacillus. Infection can very easily take place along a surface in a direction contrary to the flow over such a surface. One of the examples of this is the extension of infection from the mouth to the parotid gland. There the infection extends through a narrow channel which is well protected by an epithelial surface and against a pretty constant current. It is sometimes very difficult from the anatomical lesions to interpret the mode of infection. In the kidney both the hematogenous and urogenous are frequently combined. In the pyæmic diseases, such as scarlet fever, diphtheria, ulcerative endocarditis, we frequently find foci of suppuration in the kidney which are definitely hematogenous in origin. They are usually most prominent in the cortex. There are also undoubted cases in which there is infection of the kidney which follows upon infection of the pelvis of the kidney. There are certain anatomical distinctions between the two. In the urogenous infection, the lesions are chiefly in the pyramid, and we find in this and extending from it, long white lines of necrosis with central masses of organisms. It is perfectly possible, however, to have an infection begin in the cortex of the kidney and extend downward along the urinary tubules, in which case the most marked lesions may be in the pyramid of the kidney. Even in the hematogenous infections, the lesions may be more marked in the

\* See JOURNAL, 1916: 633.



pyramid of the kidney, and may closely simulate a urogenous infection, because the organisms may pass through the capillary circulation and find lodgement in the long veins of the pyramid. If a culture of *staphylococcus aureus* is injected into the ear vein of a rabbit there are always lesions produced in the kidney which are usually more marked in the pyramid than in the cortex. In tuberculosis, undoubtedly both modes of infection take place and they are difficult to distinguish. In general military tuberculosis, the tubercle formation is most pronounced in the cortex, but even here the lesions may be in the pyramid and from the cortical lesions there may be a further descending infection. The pelvis of the kidney, moreover, in tuberculosis, can become infected, and from this point the infection can again advance toward the kidney. On the other hand, we undoubtedly find cases of ascending urinary tuberculosis, in which the lesions below are undoubtedly of an older date than the lesions in the kidney. There is no difficulty, it seems to me, in regard to the passage of organisms from the bladder upwards. We must not think of the flow of urine in the ureters as a rushing torrent, carrying all before it, against which the weak bacillus has to struggle, but conditions easily arise in which there is no current at all, and organisms in one part of the common fluid in the bladder and ureter can be diffused through the fluid by means of the currents which are always present. Such currents may be produced by the intermittent pressure coming from the intestines or in various ways. It is also perfectly possible for the tubercle bacilli to advance along the surface from point to point, finding lodgement on the surface and growing there. In regard to the excretion of organisms by the kidney, I have always had a great deal of doubt as to whether this does take place without lesions. Lesions of the kidney are extraordinarily common in all of the infectious diseases, and from such lesions the organisms can enter into the urine where they will multiply and a condition of bacilluria which may be long in duration will be produced. This seems to me to be the case in typhoid, for instance. The experimental evidence which we seem to have, in which very large quantities of organisms are injected into the blood and later make their appearance in the urine, does not seem to me to be worth much unless accompanied by the most painstaking examination of all parts of the kidney. I always like to hear these clinical papers, especially when presented so ably as the papers were this evening, and I always regret the lack of clinical knowledge on my part, which prevents an adequate discussion.

DR. A. L. CHUTE, BOSTON: This general subject is something that has been of the greatest interest to me and upon which I hold pretty definite opinions that I have set forth in one or two papers written within the past few years. To me Dr. Cabot's theoretical views as to the source of these infections are extremely interesting but not wholly convincing. His suggestion regarding vaccination as a possible method of preventing or minimizing these infections is very attractive, but its value is not as yet proved; and I wish to warn against a too enthusiastic following of this method until we have more definite knowledge regarding it. It seems to me that there are several reasons to make us slow in adopting it until we have further evidences regarding its value.

From the theoretical point of view, I am in doubt

about one's ability to immunize these men with colon vaccine. If this were possible, more of the very constipated patients ought to develop a pretty good natural immunity, and yet we rarely see men who seem to show any signs of this.

Another objection to the plan is that it takes time to immunize patients by vaccination, and often one can ill afford to spare this time in the prostatitis with bladders overdistended with clear urine. My greatest objection, however, is that in following this method we should be substituting a cumbersome way, even if it were demonstrated to be an efficient way, for the simpler method of opening the over-distended bladder under novocaine and draining by means of a large suprapubic tube. This way, it is true, does not prevent infection of the bladder but it prevents, to a very large degree, the harm which comes from this infection; namely, the serious infection of the kidneys. Combined with this combating of the infection, it has the advantage of relieving the kidneys of the mechanical factor of back pressure in a manner that is more complete than is possible with any other way of drainage. The fear of serious collapse from opening an over-distended bladder or the danger of serious hemorrhage are under these conditions, so far as my experience is concerned, mythical, when this operation is carried out under local anesthesia.

I am sure we all appreciate Dr. Councilman's kindness in coming here this evening and giving us so clear an exposition of the pathology of the condition under discussion.

DR. E. G. CRABTREE, BOSTON: We recognize that in the paper which Dr. Cabot has just read there is a radical departure from the well-beaten textbook path of consideration of pyelitis. We regret that the paper is of necessity based upon incomplete evidence and a rather small number of cases, yet certain definite facts are indicated which have some bearing on the general subject. It is to be hoped that our search for truth may not seem to lead to our discomfiture as in the case of the man who, searching for stars by day, fell into a well.

Certain evidence has been produced in experimental laboratories which indicates that the kidney has a definite excretory action for bacteria. I have myself endeavored to demonstrate the point and, following the suggestion of Carl Ten Broeck, injected attenuated cultures of para-typhoid bacillus into the ear veins of a rabbit and recovered them from the urine in large numbers 18 hours later. A drop of urine from the bladder, which previous examinations had shown to be sterile, gave innumerable colonies on the culture media.

In regard to the existence of a blood infection during pyelitis, to which Dr. Cabot referred in his paper, certain evidence has been produced in my clinic. I have taken blood cultures on 32 cases, including 9 cases of prostatitis with infected urine at the time of entrance into the hospital. These cases all showed a clinical picture of pyelitis at some time during their stay in the hospital. I have obtained positive cultures of the colon bacillus in 13 cases. Of the 9 prostatitis examined, positive blood cultures were obtained in 7.

The demonstration of the results of vaccination is a difficult problem and must rest on clinical as well as laboratory findings. So far as agglutination is a factor of protection, the use of vaccine has apparently accomplished some good. There is some evidence that infection itself produces immu-



nity. It has been found in 3 cases in which there had been more than one attack of pyelonephritis and in which the colon bacillus had been recovered from the blood, there was a distinct increase in the agglutinating power of the serum. Likewise I was interested to find in the case of a man who had recently had 4 attacks of epididymitis due to the colon bacillus, his agglutinating power was much increased although he had not been vaccinated.

In cases in which colon bacilli have been recovered from the blood, there are two possibilities to be considered: one, that the infection enters the circulation from some point outside the genitourinary tract; and the other, that the blood is infected from an infected kidney. In our one case where careful bacteriological and cultural evidence has been produced, we obtained a positive culture from the blood previous to the appearance of the bacilli in the urine. Bearing upon this subject, last month's issue of *Jahrbuch für Kinderheilkunde* contained a review of some work by Kowitz, who had traced the order of appearance of bacteria, pus and albumin in 5 children in whom pyelonephritis developed in the course of an infectious diarrhoea. He found the order of appearance to be 1. albumin, 2. bacilli, and 3. pus. In regard to the frequency of blood infection in infectious diarrhoea, the same author quotes Baer, who found in 117 cases of infectious diarrhoea positive blood cultures of colon bacillus in 65.

I have recently read in the literature, but do not know what significance to attach to the observation, that in leprosy and tuberculous patients the use of salvarsan is followed by showers of the respective bacteria in the urine and often attended by spread of the disease.

In obtaining blood cultures of the colon bacillus, my experience has shown that it is useless to take the cultures at any considerable time after the onset of symptoms. I took blood cultures later, for a time, with almost uniformly negative results. Apparently the only time at which positive results may be obtained is at the very beginning of symptoms of pyelonephritis. Likewise in cultivating the colon bacillus from the blood, inasmuch as the immunizing power of this organism is less than that of the typhoid bacillus, the amount of blood which can be taken without danger of interference with growth is considerably greater. I take 10 cc. for each flask of culture media.

DISCUSSION CLOSED BY DR. CABOT, BOSTON: The discussion between those who have regarded renal infections as commonly haematogenous in origin and those who have regarded them as generally urogenous has long been violent and has acquired the dignity of antiquity.

It was not our intention to stir this hornet's nest at this time, though we shall have much to say on it later. However, as the question has come up, it is proper to indicate our views at this time.

The advocates of urogenous or ascending infection as the common source have always had an attractive doctrine and one peculiarly seductive to the unwary. Its weakness has lain in the fact that it has postulated certain conditions which are difficult of demonstration and which, in our opinion, do not in fact exist. In many of these cases of acute colon bacillus pyelonephritis the infection occurs in persons having no previous lesion of the lower urinary tract and in whom there is no condition likely to produce one. This is particularly

true of the cases occurring in children and in women, more especially in relation to pregnancy, and yet in these cases the lesion is precisely similar and the disease runs the same course as in those having some pre-existing lesion of the lower urinary tract. The advocates of ascending infection have had to disregard entirely the notorious fact proved both clinically and by animal experimentation, that the bladder is peculiarly resistant to infection introduced through the urethra and that in the absence of retention, infection of that organ can be produced only with the greatest difficulty. Under these conditions, to assume that the colon bacillus transverse the urethra, infects the bladder, ascends the ureter and involves the kidney requires a feat of imagination which is quite beyond us.

In favor of the excretory origin of these infections is the also well known fact that colon bacilli circulate in the blood and are excreted by the kidney under a great variety of conditions, in many of which their presence has been entirely overlooked. The best recognized cases are those of the first cousin of the colon bacillus, the typhoid bacillus, in which the excretion of the bacteria by the kidney has long been recognized. We believe that evidence is at hand to show that the colon bacillus behaves in a precisely similar fashion and that his presence in the kidney is extremely common. Thus the believers in the excretory theory can at least deliver the colon bacillus at the kidney without straining their imagination and from this point explanation of the lesions becomes a simple matter. This makes it incumbent upon the advocates of the theory of ascension to show a previous lesion of the lower urinary tract, most commonly of the obstructive type and clearly antedating the infection of the kidney. Where this can be shown, ascending infection is about as likely, though not more likely, than excretory infection, and in these cases the two types are theoretically on a par. We believe that the ascending theory of these infections has seen its best days and that in the future it will be on the defensive rather than on the offensive and will play a losing game. That it will ultimately be proved to account for a certain proportion of cases is probable, but these will, we think, be the minority.

In regard to Dr. Chute's views, I hope, with him, that the theories we have put forward this evening of what it may be possible to do, will not stampede anyone. I confess I have little fear of stampeding this gathering and yet if it should succeed in drawing some surgeons away from the method of two-stage prostatectomy, to which Dr. Chute is apparently wedded, I cannot believe that much damage will be done. The two-stage operation seems to me unsatisfactory and I am not prepared to admit that it avoids the infection of which we have been talking this evening any more surely than do other methods of drainage. Furthermore, in my hands it has not been certain to avoid a considerable mortality. The two-staged method, as proposed by Dr. Pileher at our meeting last winter, seems to me clearly preferable to any other method that I have seen, but even this I am by no means clear that we are not unnecessarily wasting the patient's time and requiring confinement to bed for a period which with these patients is certainly serious. The two-stage operation is unsatisfactory, and if by a process of previous immunization we can avoid it, I think we shall have accomplished an important result.



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## HUMAN TYPES IN THE ADOLESCENT PERIOD.

NUMEROUS papers have recently been presented, several of them in this JOURNAL, bearing upon what might be called the theoretical side of the question of type in the human, as expressed by the words *carnivorous* and *herbivorous*, or their synonyms. To the theory of type it has been objected that, even should it prove true in its entirety, it would yet remain without practical value. This objection seems by way of being refuted; thus Bryant has mentioned two independent practical investigations in progress. One, by Dr. Hodskins of Monson, is a study of type in relation to the single disease group of epileptics. The other concerns itself with manifestations of type in school children. Notes upon the second of these studies are now available, for Dr. Lewis of Worcester has published his results of an examination of 547 unselected school children in his city under the

title "Adolescent Physical Types: A Preliminary Study."

Having extensively considered the literature, Dr. Lewis proceeds to review his material, dividing it into three classes or types of body form, under the headings *carnivorous*, *herbivorous*, and *neutral* or *ideal normal*. The most striking fact elicited is that out of a group of over 500 boys of school age, less than 50, or 10%, could be placed in that favored normal group which since before the days of Phidias and the Golden Age of Greece has been held representative of the ideal in the physical development of man. The word "favored" is used advisedly, since his study has convinced Dr. Lewis that the fortunate few in this select ideal normal group possess within their perfectly formed bodies not only a maximum of resistance to disease, but a maximum prospect of a superior mentality. Thus is additional scientific evidence—were further needed—available in support of the truth of the ancient empiric proverb of the sound mind in the sound body. Scarcely less striking than the small incidence of the ideal group, is the fact that this 10% appears to represent, so to speak, a total effort of nature in the matter of perfection, since the 10% runs practically constant, regardless of race or social status.

Anatomies are written and illustrated, and medicine is taught according to this investigation, then, upon a basis of but 10% of humanity. As a result, when the young graduate in medicine is confronted by a patient, he may have the satisfying thought that there are about nine chances to one that the patient he is considering is not built according to the plan which he has so diligently studied.

What may we learn of these other nine people in ten? Dr. Lewis finds that his boys are not grouped evenly upon either side of the normal, but that they fall in the proportion of two to one on the *carnivorous* side of normal, with this tendency even more strongly shown among those of American birth.

If for every normal there are three *herbivores* and six *carnivores*, it becomes of some interest to know what physical and mental tendencies may be found in these predominating groups, with their 100% excess of *carnivores*. Dr. Lewis gives direct support to previous observations on the types, as follows: "My statistics indicate, first, that *good* posture, muscular function, nutrition and teeth are correlated with the *neutral* or *omnivorous* type, second, that *fairly*



good posture, muscular function, nutrition and teeth are correlated with the herbivorous type; third, that incorrect posture, physical defects, prominent lower abdomen (visceroptosis), insufficient muscular function, poor nutrition, defective teeth and rickets are correlated with the carnivorous type.

In general, the boys of the carnivorous group are weak, poorly nourished, lacking bone and muscular resistance in addition to having poor posture. Often the history shows diseases and other defects which greatly reduce the vigor and health of the boy, decrease his resistance to abnormal and long-continued strain, and predispose him to spinal curvature and the like. The history of diseases, as recorded on the cards, shows that headache, measles, scarlet fever, pneumonia, pleurisy, tonsillitis, and convulsions occurred about three times as frequently in the carnivora as in the herbivora. Invariably, the boys with poor marks in studies were poor in physical training.

In all types there seemed to be a direct correlation between physical and mental activities. The best marks for study and training were found in the neutral group. There were only three fair grades in study, and all grades good or excellent in physical training. Seventy per cent. of the herbivorous type have good or better grades in physical training and about 30% good in studies. Fifty per cent. of the carnivorous type have good or better in physical training, and about 30% good in studies. There were no failures in studies in the neutral group, two in the herbivorous group, and eight in the carnivorous group."

From these figures it appears that two-thirds of these 500 boys belong in a type proved to be about three times as subject to disease as the next most frequent group of boys. Further, it appears that this most numerous group is the worst developed physically. Yet, if complete failures are eliminated, it appears, that in spite of the physical handicaps which predispose to poor mentality, the average grade in studies is no worse for the poorly nourished carnivore than it is for the more perfectly developed herbivore. One inference is, perhaps, that were the carnivore given an equal chance physically, he might excel the herbivore mentally.

Whatever inferences may be drawn, however, such findings as these of Dr. Lewis are worthy of serious thought by all interested in matters

educational, and in the newer aspects of preventive medicine, and it is to be hoped that this is, indeed, but the forerunner of many similarly interesting and valuable practical studies in human development.



## HEMATOGENOUS INFECTIONS.

REPORTS of certain laboratory investigations, not generally accepted but worthy of much attention (Rosenow), indicate a possible great extension of the field now occupied by the streptococcus in pathology. Diseases now generally believed to be due to a blood-carried infection are mainly endocarditis and arthritis. Others quite probably always in this category are pyelitis, chorea (of the non-imitative type) and purpura. If we are to include also gastric ulcer, appendicitis, neuritis, myositis and other such disease conditions, we shall have a group as distinct and as large as that of syphilis and greater than that of tuberculosis.

Excluding the colon group represented by pyelitis and perhaps some forms of arthritis, the principal part of these diseases represents, we believe, a streptococcus infection which gets into the blood stream almost certainly from the mouth, throat, eyes, ears, nose, or a wound of the skin. Of these possible sources, the teeth or tonsils are nearly always the most likely. Bacteriologists (Ernst) believe that such a streptococcus is not present in the gastro-intestinal tract.

Removal of these sources and the administration of some antagonistic drugs after the disease is once started is not satisfactory treatment. Once lodged in the tissues of the body, the organism or its effects are very persistent.

What is to be emphasized is that practically all of this large group of diseases can well be considered to originate from primary disease of teeth or tonsils; that once started, consistently successful treatment cannot be said to have been achieved; and that the majority of physicians are still so careless as not to accomplish the prevention of these infections. It remains to be seen whether a pediatricist cannot definitely promise freedom from all diseases of this type so long as a patient obeys his directions. Prevention, we think, should start in infancy, and begins with the maintenance of good health. Given a healthy infant at six months, it is ques-



tionable whether we utilize his good digestion to his best advantage by not choosing his food for a more distant future than we can for those in poor health. Do we not too often sit back and watch him gain weight satisfactorily on a simple milk diet?

Durand of Seattle, Owre of Minnesota, Wallace of London, and others, publish favorable results of this choice of food on the teeth. Ordinarily, suppuration about teeth is easily seen if looked for. Cases in which a pus pocket can be detected only by x-rays are so common, however, that this method may be much too infrequently used. Just when this examination may be safely omitted has not yet been determined, so it may be more safe to use it in every case where a tooth is badly carious, even if the gums seem healthy. In children with poor teeth, a routine examination by the x-ray ought to be made every six months. Most dentists cannot guarantee complete safety in cases of suppuration by treatment without extraction. We think that safety from these diseases is more valuable than the retention of inferior teeth which, it is conceivable, may transmit disease to other healthy teeth in contact.

Radical treatment of all even faintly suspicious tonsils may seem impracticable, but it must be remembered that in childhood the painful convalescence, which is the worst of the operation for adults, is very much shortened—in fact, it is the usual thing for such a patient to eat and talk without difficulty on the morning after operation. Before and after such an operation, which in some cases has seemed to be coincident with the entrance of organisms into the blood stream, salicylates may be given, perhaps with greater security.

#### THE NEW ENGLAND TUBERCULOSIS CONFERENCE.

At the recent New England Tuberculosis Conference, held October 12 and 13, at New Haven, delegates representing all the New England States, and others to the number of nearly 300, were present. The atmosphere of this conference was a distinctly medical one, and as such, to those interested in the tuberculosis campaign, was very encouraging. There has been an evident and growing tendency on the part of the medical profession, and especially so on

the part of social workers, to regard tuberculosis as no longer a medical problem, but a social and economic one. While to a certain extent this is true, and while the social and economic aspects of this disease must receive careful consideration, fundamentally, however, we believe that the medical side of the problem is most important. That this is coming to be regarded the prevailing opinion in Massachusetts is shown by the fact that the Massachusetts Medical Society, for the first time, sent delegates to this conference. The Suffolk District Society and certain others, likewise, sent delegates. The State of Massachusetts was represented by the Trustees of Hospitals for Consumptives, the superintendents of the four State sanatoria, and others. There was present a surprisingly large number of general practitioners and of other physicians who are not ordinarily greatly interested in the tuberculosis campaign. As the early diagnosis of this disease rests almost wholly with the general practitioner, the presence of so many at this conference was an encouraging sign. It is to be hoped that the Massachusetts Medical Society will come to take an increasing interest in this disease and its prevention, and to realize that through its members, largely composed of general practitioners throughout this Commonwealth, the solution of the tuberculosis problem, in a large part, rests.

#### PROGRESS OF POLIOMYELITIS.

During the past week the epidemics of poliomyelitis have declined throughout the United States. On October 29 the number of cases in Massachusetts reached a total of 647 during the current month. On October 22 there were 58 cases in Quincy, and on October 26, 97 in Holyoke, with 21 deaths. Since January 1 there have been 1660 cases in Massachusetts.

Since July 1, there have been 420 cases and 117 deaths from this disease in Boston; and 90 cases with 15 deaths in Providence, R. I.

The weekly report of the United States Public Health Service for October 20, 1916, shows that from July 1 up to October 15 there had been 3917 cases in New Jersey, 3497 in New York State, exclusive of New York City, 1561 in Pennsylvania, 1127 in Massachusetts, 812 in Connecticut, 784 in Minnesota, 719 in Illinois, 428 in Michigan, 400 in Ohio, 361 in Wisconsin, and 254 in Maryland.



In the issue of the *Journal of the American Medical Association* for October 21, is published a preliminary note by Dr. E. C. Rosenow of Rochester, Minn., Dr. E. B. Towne of Boston, and Dr. G. W. Wheeler of New York, on the etiology of epidemic poliomyelitis. After reviewing the earlier work of Flexner and others on the isolation of the causative organism of the disease, they report the isolation from the throat, tonsils and central nervous system in cases of poliomyelitis of a peculiar streptococcus. By intravenous and intracerebral injections of cultures of this organism they have produced paralysis in animals of various species and have recovered the organism in pure culture from their nervous system. The symptoms and lesions produced are characteristic of poliomyelitis. The relation of this organism to that demonstrated by Flexner cannot yet be definitely stated, but the authors believe that the two may represent polymorphous forms of the same cocci under varying cultural conditions.

There is no further recent advance in the treatment of the disease. The Harvard Infantile Paralysis Commission has recently reported that of the cases in which therapeutic blood serum has been employed, none has completely recovered from paralysis, but only two have died.

#### MEDICAL NOTES.

**TEETH OF RURAL SCHOOL CHILDREN.**—A recent investigation made by the U. S. Public Health Service, in connection with studies of rural school children, showed that 49.3 per cent. had defective teeth, 21.1 per cent. had two or more missing teeth, and only 16.9 per cent. had had dental attention. Over 14 per cent. never used a tooth brush, 58.2 per cent. used one occasionally and only 27.4 per cent. used one daily.

**PREVALENCE OF DISEASE IN THE UNITED STATES.**—The weekly report of the United States Public Health Service for October 20, 1916, states that during the month of September there were reported in Maryland, 49 cases of malaria and 575 of typhoid fever. During the same period there were 80 cases of typhoid in Wisconsin and 16 of cerebrospinal meningitis and 373 of typhoid in Massachusetts. During the month of August there were in Virginia 2069 cases of malaria, 40 of pellagra and 1,107 of typhoid. There were 475 cases of typhoid in Kansas in August.

**GERMAN DEATH RATE.**—Report from Berlin on October 21 states that whereas in 1913 the German death rate was only 14 per thousand, the rate in 1914 was 16.1, in 1915, 19.7, but for the first seven months of 1916 fell to 16. These effects are attributable almost wholly to the war. Notwithstanding this, however, the infant mortality, which in 1912 was 14.1 per hundred new births and 15.6 in 1913, dropped in 1914 to 14.5 and in 1915 to 12.9.

#### EUROPEAN WAR NOTES.

**SALE OF TETANUS ANTI-TOXIN.**—Report from New York on October 19 states that since the outbreak of the European War the health department of New York City has sold to the allied powers nearly \$106,000 worth of anti-toxin, chiefly for tetanus. A very small amount has been sold during this period to the central powers, who have manufactured their own supply.

**MEDICAL UNIT FOR PALESTINE.**—Report from New York on Oct. 19 announces that arrangements have been made by the Zionist Committee of that city to send a medical unit of ten physicians and five nurses to Palestine, aboard the Syrian relief ship soon to sail from New York under the auspices of the Red Cross. The consent of the United States Department of State has been obtained for this purpose and it is planned, after landing the unit at some Mediterranean port, to transfer its members to Palestine aboard a United States warship. The purpose of the unit is to undertake the care of patients with typhus fever and Asiatic cholera, which are now epidemic in Palestine.

**AMERICAN RELIEF COMMITTEE FOR GERMAN BABIES.**—Report from New York on October 10 states that the American Relief Committee for German Babies, which was organized in Berlin at the outbreak of the war, by Americans resident in that city, now has about 1200 babies under seven years of age in its care. The beneficiaries are selected by the committee and the funds distributed by the German Red Cross.

The only beneficiaries of this fund are widows and orphans of soldiers slain in battle. Having chosen the family, the chairman of the American Committee, himself an American, directs the Red Cross there to make a monthly payment of \$40, and an effort is being made to pension each family for a full year.

Recent reports received at the main office of the Committee, No. 13 Park Row, New York City, show that the scheme is working out to perfection. The Berlin Red Cross has expressed its thanks, and those of its beneficiaries on more than one occasion through the medium of the wireless.

The American Relief Committee is a nationwide organization, of which George B. McClellan, former mayor of New York, is national



chairman, and John D. Crimmins, national treasurer. An additional office is maintained in Chicago at No. 220 South State Street, where Frederic W. Upham is chairman, and Charles G. Dawes, president of the Central Trust Company of Illinois, is treasurer. Members of the committee pay all operating expenses and funds donated are transmitted without deduction to the other side.

The committee has so far raised approximately \$50,000 and transmitted it by wireless to the other side, and no less than four hundred families are under its constant care."

#### MEXICAN NOTES.

**NEW RED CROSS BUREAU IN NEW YORK.**—To facilitate the dissemination among Red Cross chapters of information about the needs of European War sufferers, the American Red Cross has established a special information bureau in the Metropolitan Tower, New York, under the charge of Mr. Albert W. Staub, Superintendent of the Red Cross Receiving and Shipping Station at the Bush Terminal, Brooklyn. Mr. Staub will fill the two offices. His experience during the past two years as head of the Receiving and Shipping Station, and the steady correspondence which his office has with the receiving and forwarding representatives of various recognized relief agencies in Europe, will enable him to keep the more than two hundred Red Cross chapters in this country constantly advised as to the needs of the foreign Red Cross societies and representatives.

**STATUS OF A RED CROSS BASE HOSPITAL UNIT.**—The twenty-five Red Cross base hospitals, which have been organized or are being organized under the Department of Military Relief of the American Red Cross, have a strictly war-time purpose and are not generally available for use for civilian relief after disasters other than war, according to a Red Cross circular just issued. It says:

"Attention has been invited by the director of a Red Cross Base Hospital Unit to a misconception of the purposes of this military unit, in that a statement has been made that it would be available for purposes of civilian relief in great disasters other than war.

"This is an error, as base hospitals are purely military units, organized at the request of the Medical Departments of the Army and Navy, and equipped with a view to the needs of the military service only. In both organization and equipment they are too massive and too immobile for civilian relief work. The muster-in pledge contemplates only national service, when called into the military service of the United States; and it has been decided by the Judge Advocate General of the Army that the law does not authorize the calling out of these units by the President except in time of war or when war is imminent.

"It can be well imagined that in time of great national disaster, such as an earthquake, which involves injuries to large numbers of people, the staff of a base hospital unit might volunteer as *individuals*, and the American Red Cross would not hesitate to use the blankets, surgical dressings, and such other parts of a base hospital equipment as might be suitable for first-aid work to relieve an emergency. These supplies would, however, be regarded as a loan, and would be promptly replaced, if possible, from funds contributed to relieve the disaster. There would be no calling out of the unit as a unit, under these circumstances, and no compulsion on any member of it to volunteer."

**WAR RELIEF FUNDS.**—On October 28 the totals of the principal New England relief funds for the European War reached the following amounts:—

Belgian Fund .....	\$161,327.07
French Wounded Fund .....	130,059.27
Serbian Fund .....	101,649.07
Armenian Fund .....	80,705.05
French Orphanage Fund .....	67,906.91
British Imperial Fund .....	67,742.91
Surgical Dressings Fund .....	54,392.66
Polish Fund .....	46,620.83
Belgian Tobacco Fund .....	40,668.76
Permanent Blind Fund .....	19,004.12

#### BOSTON AND NEW ENGLAND.

**WEEK'S DEATH RATE IN BOSTON.**—During the week ending Saturday noon, Oct. 28, 1916, the number of deaths reported was 227, against 180 for the same period last year, with a rate of 15.57, against 12.54 last year. There were 38 deaths under one year of age, against 34 last year, and 66 deaths over 60 years of age, against 39 last year.

The number of cases of principal reportable diseases were: diphtheria, 48; scarlet fever, 18; measles, 4; whooping cough, 6; typhoid fever, 5; tuberculosis, 37.

Included in the above were the following cases of non-residents: diphtheria, 9; scarlet fever, 6; typhoid fever, 1; tuberculosis, 37.

Total deaths from these diseases were: diphtheria, 1; measles, 1; whooping cough, 1; typhoid fever, 1; tuberculosis, 19.

Included in the above were the following deaths of non-residents: tuberculosis, 2.

**ST. LUKE'S GUILD.** The annual meeting of St. Luke's Guild, held recently at the Carney Hospital, South Boston, was attended by over fifty members. Dr. John T. Rottenley was elected president for the ensuing year, Dr. John R. Slattery vice-president, and Dr. John J. Sullivan, secretary and treasurer.



**CHARLESGATE HOSPITAL TRAINING SCHOOL.**—The first graduation exercises of the Charlesgate Hospital Training School for Nurses were held recently in Cambridge under the presidency of Dr. George Bates. Diplomas were awarded to a class of ten pupil candidates.

**'CONSUMPTIVES' HOSPITAL CLINIC.**—It is announced that the clinic for the study of tuberculous cases which, for some time, has been conducted at the Maverick Dispensary, East Boston, jointly by the Dispensary, the Consumptives' Hospital Department and the Boston Association for the Relief and Control of Tuberculosis, will hereafter be conducted by the Consumptives' Hospital Department alone.

**MILK DEALERS' ASSOCIATION.**—The annual convention of the International Milk Dealers' Association, held in Springfield, Mass., on October 17, was attended by over 150 delegates. The leading address was by Dr. John Lovett Morse on "Milk for Infants."

"Approximately 300,000 babies die in the United States annually. If that number of infants die each year there are many millions of sick babies. A large percentage of the deaths is due to poor milk, which comes from diseased cows.

"Of the total number of cases there are about 1500 deaths a year from tuberculosis which can be traced to milk from the dairy cow. The only way to protect the public health from such diseases as tuberculosis, typhoid fever, diphtheria, sore throat and scarlet fever is by pasteurizing the milk from the cow.

"The sooner the milk dealers of this country realize that it lies within their power to save the lives of infants, fewer babies will die. The question of reducing infant mortality, in other words, is directly up to the milk dealers, who should speedily adopt measures to safeguard the public health."

Other addresses were delivered by Mr. James O. Jordan on "A Municipal Milk Supply," and by Professor W. B. Frost of the University of Wisconsin on "Milk Bacteria Count and Microscopic Test for Pasteurized Milk."

### Miscellany.

#### AMERICAN SOCIETY FOR THE CONTROL OF CANCER.

THE American Society for the Control of Cancer has recently issued the following report of its organization and activities as presented to the various special societies at the Congress of American Physicians and Surgeons held in Washington in May, 1916. The Cancer Control Society having been formed under the direct auspices

of these national medical organizations at the Congress of 1913, the present report was submitted as a summary of progress during the intervening three years in the effort "to disseminate knowledge concerning the symptoms, diagnosis, treatment and prevention of cancer, to investigate the conditions under which cancer is found and to compile statistics in regard thereto."

#### REPORT TO THE CONGRESS OF PHYSICIANS AND SURGEONS, MAY, 1916.

At the ninth meeting of the Congress of American Physicians and Surgeons held in Washington in May, 1913, the American Gynecological Society presented to the other branches of the Congress an identical resolution requesting the appointment of two or more delegates to co-operate in forming a national organization to conduct educational propaganda regarding the prevention and cure of cancer. The Gynecological Society had just adopted the report of its committee which had been at work on this problem for a year or more previously, and had recommended that a special society should be established with the sole purpose of conducting this much-needed campaign of education and the collection of data on a nation-wide basis and on a general plan similar to that of the National Association for the Study and Prevention of Tuberculosis. In preparing its report and recommendation the committee of the Gynecological Society had secured the interest and promised support of a group of lay citizens of New York, five of whom, Messrs. John E. Parsons, V. Everit Macy, James Speyer, Thomas W. Lamont, and George C. Clark, had guaranteed \$5,000 toward the first year's expensess of the proposed organization, but solely on condition that the project be approved, not only by the Gynecological Society, but by the profession generally.

A majority of the constituent societies of the Congress promptly responded to the suggestion of the Gynecological Society and the following delegates were appointed:

- (1) American Dermatological Association: Dr. S. Pollitzer, Dr. M. F. Engman.
- (2) American Surgical Association: Dr. George Brewer, Dr. Joseph Bloodgood, Dr. Charles L. Gibson.
- (3) American Laryngological Association: Dr. George B. Wood, Dr. J. Gordon Wilson.
- (4) American Otological Society: Dr. Charles W. Richardson, Dr. George E. Shambaugh, Dr. Christian R. Holmes.
- (5) American Association of Genito-Urinary Surgeons: Dr. H. A. Fowler, Dr. F. R. Hagner.
- (6) American Gynecological Society: Dr. Reuben Peterson, Dr. Edward Reynolds, Dr. Thomas S. Cullen, Dr. Frank F. Simpson, Dr. William E. Studdiford, Dr. Frederick J. Taussig, Dr. Howard C. Taylor, Dr. LeRoy Broun.



- (7) American Association of Pathologists and Bacteriologists: Dr. A. S. Warthin, Dr. James Ewing.
- (8) American Orthopedic Association: Dr. Reginald H. Sayre, Dr. J. D. Griffith.
- (9) American Ophthalmological Society: Dr. Richard A. Reeve, Dr. F. E. Cheney, Dr. Hiram Woods.
- (10) American Neurological Association: Dr. Harvey Cushing, Dr. B. Sachs.

These delegates were invited to a meeting at the Harvard Club in New York City on May 22, 1913, at which time the American Society for the Control of Cancer was duly organized and the following declaration of its design and scope embodied in the constitution:

"To disseminate knowledge concerning the symptoms, diagnosis, treatment, and prevention of cancer, to investigate the conditions under which cancer is found and to compile statistics in regard thereto."

It is but fitting that a movement which traces its origin and so large a part of its prestige with the profession and public to the Congress of 1913 should present on this occasion an acknowledgment of indebtedness to all the co-operating organizations and make some account of methods of work and progress during the last three years.

**Plan and Scope.**—The purpose of the Society as just stated prescribes two main lines of activity: (1) a campaign of public and professional instruction, and (2) the collection of statistical data. Experimental research, the support of hospitals or clinics, and the care and treatment of individual patients are not contemplated. In extending its influence and carrying on its work, the Society necessarily devotes a large share of its direct efforts to securing the interest of other organizations and forces which are in a position to render assistance in local fields.

**Professional Endorsement.**—In the months immediately following the formation of the Society under the auspices of this Congress, other prominent professional bodies successively recorded their approval and support of the project. Resolutions of endorsement have been adopted by the American Medical Association, the Clinical Congress of Surgeons, the Western Surgical Association, the Southern Surgical and Gynecological Association, and many state and local medical societies.

**Executive Control.**—The government of the Society is vested in a Board of Directors which numbers 66 members, including practitioners of recognized standing and prominent and interested lay men and women from many parts of the country. The direction of the work in detail is delegated to an Executive Committee of thirteen Directors including the chairmen of standing committees on organization, membership, finance, publication, and statistics. The professional members of the Board act in conjunction

with the Executive Committee as an Advisory Council which formulates the general policies of the Society.

**Membership and Finance.**—In so far as paid service is necessary to supplement the volunteer work, which is the chief source of the Society's vitality, a modest budget is raised entirely from dues of members at five dollars per annum and from special contributions in larger amounts. The Society has no endowment and no fixed income from any philanthropic foundation. At present there are 577 members and contributors of all classes, approximately half of whom are physicians, the list including some of the leading American practitioners. The interest and support of these doctors is a chief asset of the Society and this opportunity is taken to urge every member of the Congress of Physicians and Surgeons to contribute his influence by becoming an annual member.

**State and Local Committees.**—Branch committees of the Society are formed in the several states and cities, not as independent local organizations, but as integral parts of the single National Society. The chairmen of state committees are usually members of the National Board of Directors and are vested with full power to appoint the other members of their committees and supervise their work. State committees in turn may organize local committees in the principal centers of population wherever the interest and needs warrant. At the present time state committees have been authorized in sixteen states and several others are in the process of formation.

**Organization and Cooperation.**—The Society has considered it a matter of first importance to develop its National Executive Office as a central bureau and clearing house through which to seek the coöperation of all appropriate general and local agencies, and to receive and transmit impulses tending to further the propaganda of public instruction in all parts of the country. Standing in close relation, on the one hand, to the leading experimental and statistical students of the disease who represent sources of new and old knowledge of the subject, the Society is, on the other hand, in helpful contact with the various social forces which can be called upon to transmit the essential facts to the public.

**Boards of Health.**—Widespread and increasingly effective work is being done by state and city boards of health in the direction of instructing the public regarding the prevention of disease. The Society therefore endeavors to have the more progressive health officers devote a proportionate share of attention to cancer in this connection, and the national office undertakes to furnish data, statistics, and special articles produced under the supervision of the appropriate committees, for local use in the name of the board of health. Many health boards, including particularly those of Michigan, Vir-



ginia, North Carolina, New York, Massachusetts, Kansas, New York City and Toronto, are now taking an active part in this campaign, while a number of other departments have made a beginning.

*Medical Societies and Education of the Profession.*—The design of the Society is taken to include efforts to keep the general practitioner in touch with the latest developments in the knowledge of cancer, and cognizant of his duty to the patient. In this field, however, it is felt that the regular professional organizations should take the lead. The Society, therefore, offers all possible coöperation and assistance to state and county medical societies in providing literature and speakers, and to the various medical journals in publishing appropriate articles. Many state societies have appointed special cancer committees, some of these, as in the case of Pennsylvania, antedating the formation of the national organization and representing notable pioneer work in this field in America. In several instances the committee of the National Society and that of the state medical society have been made identical. The existing state committees on health and public instruction have also been approached with reference to the inclusion of cancer in their programs.

*Nurses.*—Systematic effort is made to promote the instruction of nurses regarding the earlier phases of malignant disease and predisposing conditions, in order that they may be adequately prepared to advise people, especially women with whom they come in contact in the course of their duties, to seek professional attention in time. A series of special articles for nurses has been published, meetings for nurses have been arranged, all the leading schools of nursing in the country have been urged to include in their courses lectures on the early signs and symptoms of cancer, and opportunities are sought to present the subject at the annual meetings of state and national organizations of nurses, a number of which have recorded their endorsement of the purpose and methods of the Society.

*Social Workers.*—The field workers of charity organization societies have similar opportunities to advise people who do not ordinarily read newspapers and educational books and pamphlets. The National Office has, therefore, circularized several hundred of the larger charity organization societies in the various states, seeking their interest and coöperation in holding public meetings and in arranging for the special instruction of the members of their working forces.

*Women's Clubs.*—Women's organizations have proven one of the most effective single agencies in disseminating knowledge of early cancer and the conditions leading to the disease. The work of the Society has been brought to the attention of the national and state federations of women's clubs, and the appropriate committee officials have been circularized in or-

der to secure their coöperation in suggesting this topic to local clubs. As a result, women's clubs in many states and cities have frequently taken the lead in arranging public meetings and in providing lectures in their regular study programs.

*Insurance Companies.* The coöperation of the leading insurance companies is sought, not only in respect to statistical investigations, but for the distribution of educational literature. One of the largest companies has reprinted, at the suggestion of the Society, a cancer leaflet which it is prepared to distribute to the number of two million copies. At the recent meeting of the American Life Convention a resolution was adopted providing for the distribution by insurance companies generally of a brief uniform circular, approved by the Society, to be sent out in premium notice envelopes, thereby reaching many thousands of intelligent people. The Life Extension Institute, which grew out of the educational work of insurance companies, has advised its subscribers regarding the early recognition of cancer, and is indirectly furthering the campaign by its propaganda for periodical physical examinations.

*Industrial and Welfare Organizations.*—Many of the larger industrial, commercial, and transportation companies have undertaken extensive welfare work and health instruction for the benefit of their employees. The Society has offered to the appropriate officials of these companies any desired assistance in providing speakers and circulars, or suggestions for the preparation of special literature to be distributed by the companies themselves. In this connection the coöperation of such organizations as the National Civic Federation, the National Safety Council, and the American Museum of Safety has been invited.

*Newspaper Publicity.*—By direct effort and through its local committees and various other agencies already referred to, the Society stimulates the publication of carefully considered newspaper articles. So far as possible, the character of this matter is controlled by the national organization, which sends out in its own press service short articles prepared under the close scrutiny of a committee on publication, made up of professional men of recognized standing. From the beginning, the Society has also had the benefit of the constant advice and coöperation of the Council on Health and Public Instruction of the American Medical Association, and by special arrangement a cancer article has been supplied for each issue of A. M. A. press service, which reaches a selected list of several thousand newspapers. Valuable newspaper publicity has also been secured through the work of some of the leading state and city boards of health, whose statements to the editors on this topic are frequently given better attention and more space than articles sent out by a distant national bureau.



**Circulars and Bulletins.**—The Society has published for general distribution to the public a number of leaflets giving in simple language the elementary facts about the disease. These circulars are distributed directly on request to the central office or indirectly through local committees. Arrangement has been made to provide these or other approved circulars at small cost to boards of health and other local organizations in a position to purchase and distribute such material.

A series of special bulletins is also published for more limited distribution among members of the Society and those who are directly concerned in organizing local educational campaigns.

**Public Meetings and Lectures.**—To inaugurate work in each of the more important cities, the coöperation of professional, civic, and religious forces is secured in arranging a general public meeting, at which recognized experts may discuss the various phases of the cancer problem. Perhaps even more effective in reaching the public with the facts are lectures given under various auspices, particularly women's clubs, to small audiences under conditions such that a single speaker can present the subject in a more direct and convincing manner. It is a particular function of local committees to arrange for such lectures. The Society, through its national and branch offices, undertakes to act as a lecture bureau and to provide qualified speakers for meetings in any part of the country.

**Statistical Research.**—The second principal object of the Society is to organize statistical research on a broader basis than has hitherto been possible. While numerous individuals, clinics, research laboratories, insurance companies, and public health departments have been interested in this field and have done valuable independent work, the Society has now undertaken to coördinate all these agencies for the conduct of special investigations on a larger scale. To this end a Statistical Advisory Board has been formed, which includes thirty representatives of the leading American organizations in the several classes referred to.

**National Mortality Statistics.**—At the suggestion of the Society the Director of the United States Census has ordered the publication of a special report on the cancer mortality of 1914, which is now in press, and will constitute one of the most important statistical studies of this disease so far made under the auspices of any government. An important advance undertaken in this connection, at the suggestion of a prominent American surgeon, is the distinction made between the figures of deaths in which the diagnosis was reached after autopsy, surgical intervention, or microscopical examination, and those in which the diagnosis was based merely on clinical observations. In addition, the forthcoming report will give the figures in far greater detail than hitherto, and according to 29 separate organs and parts of the body affected instead of

under the seven group titles of the International List of Causes of Death as used in the annual reports of the Census Bureau. Much of the improvement with respect to greater detail and accuracy which characterizes this special report will, doubtless, become a permanent feature of the American national statistics of cancer.

**Operative Statistics.**—The Society has also undertaken the collection and study of records of operations for cancer in numbers approximately as great as those represented in the national mortality statistics. A blank has been prepared by a sub-committee of the Statistical Advisory Board, and leading surgeons throughout the country are asked to coöperate in this study by reporting thereon a few essential facts regarding each case of the disease on which they operate, either in private practice or in hospital service. The records thus obtained will be followed up at intervals of one year by inquiry addressed to the surgeon, and the data will be tabulated and analyzed by expert statistical methods. Any new and definite evidence as to the curability of cancer which may result will be laid before the public in the course of the educational campaign, but any such announcement will be in the name of the Society, and no comparison or publication of the work of individual surgeons will be authorized.

**Hospital Records.**—The committee on statistics has also prepared a series of more detailed blanks, one for each principal type of malignant disease, on which to record the full history of cases as a basis for careful study of etiological factors. These forms have been put into experimental use, and when perfected will be offered for use in a number of the larger hospitals in the endeavor to bring out important factors surrounding the occurrence of cancer in the individual, in the family, and in the community.

## Correspondence.

### AN ERROR OF QUOTATION

DORCHESTER, MASS., OCTOBER 5, 1916.

MR. EDITOR: Permit me to call to your attention a slight error in quotation and in authorship. I refer to "In medio tutissimus ibis," which occurs in Dr. F. Fremont-Smith's paper in *Boston Medical and Surgical Journal* of October 5, 1916. The line is from Ovid's *Metamorphoses*, II, 137, and not from Virgil.

The complete verse reads: "Inferius teras, medio tutissimus ibis."

Very sincerely,

WAL. B. BATHURST, M.D.

[NOTE.—This quotation occurred correctly in the issue of the *Journal* for June 10, 1915 (Vol. CLXXII, p. 849). Had the proof of the present article been more carefully read, the error would probably have been detected in this instance. —EDITOR.]



# CHANGES IN THE MEDICAL CORPS, U. S. NAVY, FOR THE THREE WEEKS ENDING OCTOBER 11, 1916.

September 22.

Surgeon H. F. Strine, to Naval Hospital and School, Washington, D. C., September 25, 1916.

Surgeon R. W. Plummer, to *Alabama*.

Surgeon G. F. Freeman, detached *Tacoma* to home, wait orders.

P. A. Surgeon H. A. May, detached Marine Barracks, Port Royal, S. C., to home and wait orders.

P. A. Surgeon P. E. Garrison, detached *Dolphin* to duty with Expeditionary Forces in Santo Domingo.

P. A. Surgeon E. H. H. Old, detached Naval Hospital, Washington, D. C., to *Solace*.

P. A. Surgeon D. G. Allen to *Chester*.

September 22.

Surgeon H. C. Curl, detached Force Surgeon, Reserve Force Atlantic Fleet, to Marine Barracks, Port Royal, S. C.

P. A. Surgeon G. B. Tribble, to Naval Academy, Annapolis, Md., Sept. 25.

September 23.

P. A. Surgeon E. R. Huff, detached *Scorpion* to home and wait orders.

September 25.

Surgeon C. D. Langhorne, resignation accepted from Sept. 29, 1916.

P. A. Surgeon D. H. Noble, to Naval Hospital, Philadelphia, Pa.

Asst. Surgeon J. H. Brantley, commissioned from August 26, 1916.

Asst. Surgeon A. H. Cecha, commissioned from Aug. 29, 1916.

Asst. Surgeon I. W. Jacobs, commissioned from Aug. 26, 1916.

Asst. Surgeon P. F. Prioleau, commissioned from Aug. 29, 1916.

Asst. Surgeon F. T. Power, commissioned from Aug. 28, 1916.

October 4.

Surgeon C. E. Triebly, detached *North Dakota* to *Illinois*.

Medical Director George B. Wilson died at Boston, Mass., Oct. 1, 1916.

Asst. Surgeon John Harper, detached *Minnesota*, to connection fitting out *Arizona*, and duty on board, when commissioned.

October 5.

Surgeon J. S. Taylor, detached *Rhode Island*, to *Connecticut*.

Surgeon C. G. Smith, detached Bureau of Medicine and Surgery, Navy Department, to fitting out *Arizona*, and on board when commissioned.

Surgeon J. A. Murphy, detached *Michigan*, to Bureau of Medicine and Surgery, Navy Department, Washington, D. C., Oct. 14, 1916.

Asst. Surgeon R. L. Crawford, detached *Connecticut* to *Rhode Island*, Oct. 5.

Medical Director Philip Leach, detached Naval Hospital, New York, to command Naval Hospital, Boston, Mass.

Medical Inspector G. A. Lung, detached Naval Torpedo Station, Newport, R. I., to command Naval Hospital, New York.

Surgeon H. C. Curl, to *Michigan*.

P. A. Surgeon G. R. W. French, detached *Maine*, to Torpedo Station, Newport, R. I.

October 6.

Surgeon H. D. Wilson, to home and wait orders.

P. A. Surgeon J. B. Mears, detached *Memphis*, to Expeditionary Force, Santo Domingo.

## ARMY MEDICAL CORPS EXAMINATION.

The Surgeon-General of the Army announces that preliminary examination for appointment to first lieutenants in the Army Medical Corps will be held early in January, 1917, at points to be hereafter designated.

Full information concerning this examination can be procured upon application to the "Surgeon General, U. S. Army, Washington, D. C." The essential requirements to secure an invitation are that the applicant shall be a citizen of the United States, between 22 and 32 years of age at time of receiving commission in Medical Corps, a graduate of a medical school legally authorized to confer the degree of doctor of medicine, of good moral character and habits, and shall have had at least one year's hospital training as an interne, after graduation. Applicants who are serving this post-graduate internship and can complete same before Oct. 1, 1917, can take the January examination. The examination will be held simultaneously throughout the country at points where boards can be convened. Due consideration will be given to localities from which applications are received, in order to lessen the traveling expenses of applicants as much as possible.

In order to perfect all necessary arrangements for the examination, applications should be forwarded without delay to the Surgeon General of the Army.

There are at present two hundred and twenty-eight vacancies in the Medical Corps of the Army.

## NOTICES.

**HARVEY SOCIETY LECTURES.**—The second lecture of the current twelfth course before the Harvey Society will be given at the New York Academy of Medicine on Saturday evening of this week, November 4, by Dr. F. M. Allen of the Hospital of the Rockefeller Institute on "The Role of Fat in Diabetes."

**SUFFOLK DISTRICT MEDICAL SOCIETY, CENSORS' EXAMINATION.**—The censors of the Suffolk District Medical Society will meet to examine candidates for admission to the Massachusetts Medical Society at the Boston Medical Library, 8 The Fenway, on Thursday, November 9, at 4 P. M.

Candidates, who must be residents of the Suffolk District or non-residents of Massachusetts, should make a personal application, at least three days before the examination, to the Secretary, at 355 Marlborough street, between 4 and 5 o'clock, P. M. (except Saturdays and Sundays), and present their medical diplomas.

DAVID CHEEVER, Secretary,  
Suffolk District Medical Society.

## APPOINTMENTS.

**HARVARD MEDICAL SCHOOL.**—Dr. Edward H. Nichols and Dr. Charles A. Porter, formerly associate professors of surgery in the Harvard Medical School, have been appointed clinical professors. The following appointments as assistants have been confirmed: Dr. Donald M. Glover, assistant in histology; Dr. Joseph H. McGuire, assistant in histology; Dr. Maelver Woody, assistant in pathology; Dr. Harry S. Bernstein, assistant in pathology; Dr. Francis L. Burnett, assistant in pathology; Dr. George Clymer, alumni assistant in neurology; Dr. LeRoy C. Gardner, instructor in pathology.

## RECENT DEATH.

DR. D. BRADYEN KYLE, who died of pneumonia, on Oct. 23, at Philadelphia, was born at Cadiz, O., in 1853. He received the degree of M.D. from the Eclectic Medical College of Cincinnati, Ohio, in 1891. He was known as a specialist in rhino-laryngology, and has written several text-books on diseases of the nose and throat. He was formerly president of the American Laryngological Association.



# The Boston Medical and Surgical Journal

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## Therapeutic and Preventive Medicine.

### TREATMENT OF WEAK LABOR PAINS.\*

BY STEPHEN RUSHMORE, M.D., BOSTON.

THE subject of weak labor pains is one in which both the specialist and the general practitioner are interested. It is a timely one for consideration, I think, because of the present indiscriminate use of two means of assisting the unavailing efforts of the woman in labor to deliver herself of her child on schedule time. These are the extract of the pituitary gland and Cesarean section. In the past the obstetrical forceps has come in for its share of condemnation, but I think it has fallen somewhat into disuse now that the other methods have come into vogue.

Before discussing whether weak labor pains need any treatment, and, if treatment is indicated, when it should be instituted and how it should be carried out, it may not be out of place to recall some of the features of normal labor for purposes of comparison. Perhaps, by a consideration of the mechanism and physiology of normal labor, some light may be thrown on the pathological condition.

By the term "labor," we mean the effort of the female organism to separate from itself the products of conception. This effort, though largely involuntary in character, is not unconscious, but is accompanied by sensations of a disagreeable nature so acute and severe that

they are called pains. So far as we know, labor is always painful among the higher mammals; the few exceptions are of interest as curiosities rather than as indicating a normal condition from which painful labor is a pathological deviation. To be sure the process seems to make greater demands on the individual in the higher forms, and among human females, the more highly civilized are more subject to difficulties of labor, of one sort or another.

Labor, terminating the period of gestation, comes on in the human female about two hundred and eighty days from the appearance of the last menstruation. But, if ovulation occurs about midway between the beginnings of two menstrual periods, as seems probable, conception takes place no less than two weeks from the beginning of the last menstruation, and gestation is more nearly two hundred and sixty-five days. But gestation is not always terminated on this two hundred and eightieth day, and while the well known rule for computing the date of confinement gives the day on which labor is most likely to begin, a week's variation in either direction is entirely normal.

When labor comes on, the uterus tries to expel its contents by contraction of the muscular fibres. These involuntary efforts recur at rather regular intervals, becoming stronger and more frequent. In time there are added voluntary contractions of the muscles of the abdominal wall and of the diaphragm, aiding in the expulsive effort. At first the contractions are manifest to the patient only as a drawing or tightening sensation, but later they are associated with pain, gradually becoming severe. During a painful contraction,

\* Read at a meeting of the Penobscot County Medical Society, April 18, 1916.



the pain comes on at a distinct interval after the contraction has begun, and is due to pressure of the presenting part and stretching of the cervical canal and the vagina as well as to the spasm of the muscle. For a long time three stages of labor have been recognized: (1) the stage of dilatation of the cervical canal until it is large enough to permit the passage of the fetus from the uterus; (2) the stage of expulsion, during which the fetus is expelled from the uterus and the vagina is dilated; it is terminated by the birth of the child; and (3) from the birth of the child to the expulsion of the placenta.

Of the nervous mechanism we know little except in a general way. The uterus is abundantly supplied with nerves and ganglia and can carry on its usual function separated from the central and sympathetic nervous systems, as is shown by experiments on the isolated pregnant uterus of animals. Clinical observations have shown that complete transverse section of the spinal cord does not interfere with labor except in so far as it prevents the contraction of the abdominal muscles. That psychic influences may play a part is well known, but in general the central nervous system has only a regulating function. There may be, and probably are, several centres in the cord from which reflex impulses may inhibit or accelerate labor, but of them we actually know very little.

Experience has shown that the computed date for confinement, two hundred and eighty days after the appearance of the last menstruation, is about the best time for the infant to be born. If it is born much before this date, it is underdeveloped and not likely to live. If born much after this date, not only is the child larger and thus likely to cause more difficulty during birth, but for reasons of which we know nothing its vitality is often found to be reduced, even if birth has been normal and easy. How does the maternal organism know when to fall into labor, and how does it know what is the best time for the child to be born?

Explanations of the cause of labor are numerous and date back to antiquity. Some of them are fanciful and need only to be stated to show their error. Others are more reasonable, but must await further investigation for a final judgment as to their validity. In certain cases of labor before term, we find disease of the placenta, or of the decidua, overdistention of the uterus, or trauma, which may have been the cause of the incidence of labor in that particular case, but in normal labor at term no such factors are present. We might make an exhaustive study of the ways in which labor can be induced, and comparing the changes which occur with the changes in normal labor might find a suggestion as to the usual cause. But this has not yet been done.

One constant fact we have as a basis. There is in pregnancy a growing irritability of the uterus, and with it an increase in frequency and

strength of the intermittent contractions known as pregnancy contractions. But of the cause of this we know nothing. Another characteristic of the pregnant uterus is that if strong contractions are started from any cause, they tend to continue until labor is ended. At the present time, when we are finding the long-looked-for explanation of so many phenomena of living organisms by the help of the finer chemistry, it is natural that the suggestion should be made that some substance circulating in the maternal blood should be the cause of labor pains, and experimental investigations bear this out, though only a beginning of study along these lines has been made. In the first place, experiments have shown that the connections with the central and sympathetic nervous systems are not necessary for labor. These and other experiments indicate that the cause of labor is a substance in the maternal circulation acting on the uterine muscle or on the intrinsic nerves of the uterus.

What is this substance and from what organ or structure does it come? Its nature is wholly unknown to us but its point of origin can be tested in a general way by injecting into animals, near term, extracts or blood from various sources. It has been found that injections of from twenty to fifty cubic centimeters of fetal blood into the vein of a pregnant woman at, or near term, will bring on labor in a few hours. The conclusion has been drawn that labor is due to a substance produced by fetal metabolism, accumulating in the uterus and giving rise to gradually increasing irritability.

While there is no reason, I think, for doubting the experimental facts, the conclusion may be open to certain objection. These experiments, and others which I will not take the time to describe, have established simply the facts that the substance or group of substances which produces labor is found in the fetal and in the maternal circulation. But as an interchange of substances between the two circulations is possible, the primary source of the stimulus is not clear.

The duration of labor depends on a number of factors which may be grouped under the following heads:

1. The force exerted by the uterus and by the abdominal muscles in dilatation and expulsion.
2. The application of this force, whether mechanically advantageous or disadvantageous. The vertex presentation with head well flexed and membranes unruptured gives an application of the force during dilatation of the cervix which is very advantageous. Malpositions of the fetus with ruptured membranes may give a very disadvantageous application.
3. The resistance of the maternal parts, which has to be overcome.
4. The size of the fetus.

The test of normal labor is that the woman should pass through this process without injury



to herself, and deliver herself of a normal child in approximately the same time as other women. It is a test which we can apply easily when labor is over, and which we can apply in a general way during labor, but we are quite at a loss before pains have started. While we can measure the pelvis and determine the position of the child, guess at its size and estimate the resistance of the soft parts, we have little accurate knowledge of these points and we can only be in doubt and ignorance when it comes to judgment as to that most important factor,—the strength of the uterus.

Efforts have been made to study the pains of labor with some exactness, measuring their force and duration and noting their character. The classic tokodynamometer of Selatz, a compressible bag introduced into the uterus and connected by a tube with a column of mercury, has proved very useful in spite of its limitations. But it is applicable only in special studies and is not suitable for routine procedures. Recently Fabre has described what he calls external hysterography, a method of automatically recording the contractions of the uterus during the course of pregnancy, labor and the puerperium. The apparatus is applied to the abdomen and the record is made by means of levers, a drum and revolving cylinders. It may be employed at any stage of labor and is not disturbed by respiration or by the fetal movements.

By this apparatus Fabre was able to get a better idea of the character and strength of labor pains than by palpation, timing the pains and noting the subjective symptoms of the patient. He was able to observe also the effect of drugs on the uterine contractions. He claims that the administration of chloral hydrate, ether and morphia, controlled by hysterography, will give marked diminution of the pain of labor, without interference with the muscular activity and without endangering the life of the fetus.

If a patient is in labor, how can the process be modified, either by increasing or diminishing the pains? Here the same factors by which labor may be induced come into consideration, but I shall only mention at this point some of the results of Fabre's studies of drugs in checking uterine contractions. Chloroform and ether cause a slight diminution in the force of the pains; chloral hydrate makes them more regular as well as diminishes the frequency. Morphia seems to diminish the intensity of the abnormally strong pains while scopolamin seems to cause a cessation of activity. These results have not yet been confirmed by other investigators using his method, but the method would seem to offer possibilities of considerable advance in the accuracy of our knowledge.

What do we mean by the expression, "weak labor pains"? The term is relative, for in the course of normal labor the pains are, at times, of little force and yet are perfectly normal, as, for example, early in the first stage and in the

third stage. Sometimes, too, in the first or second stage, the pains may show a marked remission in force, but they begin again with renewed vigor and continue until labor is terminated within the normal period of time. So that by weak labor pains we mean lack of force over a prolonged period or at a time when we should expect the pains to be forceful. They may occur in the first, second or third stage, and as uterine contractions continue after the expulsion of the placenta: a complete study would cover this period also, for post partum complications may develop as a result of weak uterine contraction.

Weak labor pains may be either primary or secondary. By primary, we mean those in which either the normal stimulus to contraction is weak, or the muscle itself does not react well. Of the normal stimulus to contraction we know very little, but if it is a substance from the fetus accumulating in the uterine wall and sensitizing the uterus, we can see how insufficient sensitizing might be a factor, at term or particularly before term. While this would explain certain cases of defective uterine contraction, there is little more than theory for a basis.

Of defective muscular development, a little more is known. Patients with delayed uterine development, or those who have passed beyond the highest development and are approaching the senium, or those who show developmental malformations, more frequently show anomalies of uterine contraction, which are perhaps due to defective development of muscle. Defective innervation may also play a part. It is my impression that the increasing difficulty which the modern civilized woman has with labor is due to defective hygiene during the period of adolescence, which has its effect not only on the nervous system, making women less capable of standing the strain of pregnancy and childbirth, but through underdevelopment of the genital system actually increasing the strain.

Primary weak pains are not at all infrequent and may be due not only to the causes mentioned, but to any factor affecting the general condition of the patient, as prolonged ill health from any cause, as well as to local disease which has reduced the strength of uterine muscle, once well developed.

By secondary weak pains we mean those which are weak having once been strong. This condition comes on because the muscle is tired from overwork. Here again we have a relative term, for what might be entirely adequate force under certain conditions is not enough if there is slight obstruction, or difficulty of delivery due to occiput posterior or breech, or slight disproportion between head and pelvis, or rigidity of the soft parts.

Now if we have a patient in whom the pains of labor are weak, according to our definition, that is, over a prolonged period or at a time when they ought to be strong, why should we do anything? Will not nature prove adequate



and will not the woman deliver herself in the course of time? The mere asking of this question brings clearly to the minds of all of us the sad memory of times when nature did not prove adequate and when in spite of such assistance as we could render, the mother as well as the child suffered greatly. But it does not give the answer as to when assistance is indicated, nor the kind of assistance that may be most appropriately rendered. These are determined by the stage of labor, the condition of the mother and the child and by the resources which we have at our disposal. I am taking it for granted that thorough examination has excluded as far as may be the presence of any gross anomaly of fetus or pelvis.

A consideration of the resources at our disposal will show what they can and cannot accomplish and thus the indications for their use. Among the resources are, briefly, rest, massage of the uterus, changes in position in bed and by walking, rupture of the membranes, dilatation of the cervix and the administration of drugs. Sometimes in normal labor we see the pains die down and, after an interval of apparent rest, start up again with renewed vigor and go on to the termination of labor. In certain cases after the onset of labor, when the pains are weak or have disappeared, the patient will rest or even sleep following the administration of chloral hydrate, morphia, or scopolamin and morphia, and on waking will complete labor with normal pains. This happy outcome may be expected only when the mother and fetus are in good condition and the inertia is manifest in the first stage of labor, when alone this treatment is justifiable.

Since certain mechanical stimuli increase the rate and force of uterine contractions, massage of the fundus is a rational method of treatment, but experience has shown that it does not accomplish what we want, producing only a single contraction while the stimulus is applied. The same may be said of changes of position in bed, turning the patient from side to side or from back to side. It may produce a few contractions, but that is all.

In the first stage we have all found that having the patient walk around the room is a useful and sometimes a perfectly adequate stimulus.

Occasionally early rupture of the membranes will give increased activity of the uterine contractions, but how it acts is not clear, and in general it does not accomplish much, and if the bag of waters is opened too soon the patient loses the benefit of the hydrostatic wedge in the dilatation of the cervix.

But what we want is a more certain method of inducing labor pains or stimulation to adequate activity if they are present but weak. This is found in forcible dilatation of the cervix. It is perhaps a part of the mechanism of normal labor, the increasing dilatation from pressure of the presenting part producing in-

creased uterine contractions. Two methods have been suggested in practice,—manual dilatation and dilatation with a bag, various forms of which have been employed by different operators. In either case an instrument may have to be used to start the dilatation, until the fingers can be introduced or until the bag can be placed in the cervix, but it is not always necessary.

Manual dilatation requires surgical anesthesia and is rapid and, therefore, more likely to give troublesome lacerations of the cervix. There is a certain increased risk from infection. It should be given up in favor of the bag except when rapid dilatation and immediate delivery are necessary. Here for primigravidae I personally prefer to replace it by another procedure of which I shall speak presently.

The type of bag which is perhaps most frequently used in this country is that suggested by Voorhees of New York. It is cone shaped with a tube attached to the apex of the cone, and is made in several sizes. It is made of linen or cotton fabric, covered on both sides with rubber, and is, therefore, watertight as well as inelastic. It is introduced in a collapsed condition, without an anesthetic, under primary ether, or preferably, under nitrous oxide or nitrous oxide and oxygen anesthesia, and filled with sterile water. The tube is then tied or clamped and the patient left alone. If labor does not come on promptly, or if there is reason for hastening labor, traction on the bag may be made by a weight hung over the foot of the bed. It is a most efficacious instrument and I know of only one objection to its use, namely, the possibility of introducing infection. But it would seem that careful technic would almost eliminate this danger, and I have never seen a case of infection following its use.

I have referred to those cases in which with weak uterine contractions and undilated cervix, immediate delivery becomes necessary in the interest of the mother or of the child. The possibilities are rapid dilatation of the cervix and extraction of the child by forceps or after version, and Cesarean section. The discussion of the indications for either procedure is outside of my province this evening, but I would simply call your attention to the advantages of the so-called vaginal Cesarean section, which is not a Cesarean section at all, over manual dilatation of the cervix.

The operation is to incise the cervix in the median line anteriorly and posteriorly, if necessary on both sides also, until an opening is obtained large enough to permit extraction of the child. The irregular lacerations following manual dilatation, extending an uncertain distance, are replaced by incisions made by a sharp instrument, and therefore, with less trauma, under constant supervision. Suturing after extraction is more easily accomplished. If necessary, incisions of the perineum are made and easily closed.



The last resource which I shall consider, and it is the last in the order of consideration and not in the order of use, is drugs. Among drugs which have been used to stimulate uterine contractions there might be mentioned many which have been tried, but were soon rejected. Recently there have been subjected to the test of practice salicylic acid, sodium borate, cannabis indica, strychnia, cola, cane sugar, milk sugar, digitalis and caffeine.

Certain oils have been recommended as emmenagogues and it is known that they will produce abortion; for example, oil of rue, of thyme, of turpentine, apiol, and sabine. The suggestion was made that under proper control they might be useful in stimulating normal uterine contractions. Careful tests of their action on the isolated uterine muscle of pregnant and non-pregnant animals have been made. It was found that they have a paralyzing action even when very dilute, so that they are to be regarded not only as of no value, but as positively dangerous in practice.

Noteworthy among the substances which have been given up after trial is pilocarpin which has a distinct oxytocic effect as shown by clinical experience as well as by laboratory experiments. Its use was begun about forty years ago and it was administered hypodermically during the period of dilatation. Troublesome symptoms, however, as salivation, possible unfavorable action on a weak heart and occasional tetanus of the uterus led to its disuse.

Quinine also had a vogue and was warmly recommended. Then followed a period of neglect and a recent period of revival of its use. Experimentally its effect in toning up the uterus is evident. But while it has this use clinically also, and is quite safe for the mother and child, its effect is inconstant, may not appear at all, may appear late or may be very slight. It is most effective in the period of dilatation. Very recently it has been used after pituitrin in cases in which the desired effect did not appear, and it has given gratifying results.

In considering ergot and its preparations and derivatives, we come at once to a field of active controversy. It is not because of any doubt as to the intensifying effect of ergot on the uterine contractions. This was known to Hippocrates. The drug is mentioned in the early Chinese literature and in the Middle Ages was much used as an abortifacient. Its use was known to be associated with danger and there occurred isolated cases of poisoning as well as epidemics of ergotism, the so-called sacred fire.

For over a century efforts have been made to obtain from the crude drugs the active principle in a pure state, and the effort, continued to the present time with the resources of modern chemistry, has not been crowned with unqualified success. Various substances have been isolated, one of which produces effects closely resembling the typical effects of ergot; the second is much like adrenalin, and a third is like preparations

of the pituitary gland. Still other substances have been obtained by other investigators. While this is very interesting from the theoretical point of view it has not much practical bearing, though very recently preparations have been produced which at first sight seem promising. As yet there has not been opportunity for their thorough trial.

The old question of when to use ergot, closed as some of us thought, has been opened again by Kehrer who found that in a series of closely watched cases, ergot at the end of the stage of dilatation had no tendency to cause tetanus. This differs from the generally accepted view and so the controversy has begun again.

Ergot is acknowledged to be the sovereign remedy for relaxation of the uterus following the expulsion of the placenta, but likely to cause some embarrassment if used during the third stage of labor. With reference to the use of ergot early in labor, Schatz, by means of the tokodynamometer, showed that small doses of ergot would increase the force of the uterine pains, without tetanus. But he also called attention to the difficulty of getting the exact dose required. Others tried fractional doses and claimed excellent results, but the weight of opinion has been, and still is, to wait until the end of the third stage.

It would seem that these difficulties are not inherent in ergot itself, but in the preparations of ergot, which deteriorate rapidly. The crude drug itself varies greatly in value according to conditions of growth which vary from season to season, and from district to district in which the ergot grows. These facts shift the problem to the pharmacologist or to the chemist, at least from the clinician for the present.

In view of all these facts, it is not to be wondered at that Hofbauer's communication in 1911, in regard to extracts from the hypophysis, was received with great interest. In 1885, Pierre Marie had first called attention to a relation between the genitalia and the hypophysis, in noting that there was some connection between acromegaly and tumors of the hypophysis. The etiological significance has been made clearer by surgery, in that removal of the tumor relieves and sometimes cures the symptoms. The description of Froehlich in 1901 of the clinical picture known as dystrophia adiposogenitalis showed that there were metabolic relations between hypophysis and sexual organs. Among other signs there is defective development of the secondary sexual characteristics. In the female, the hypophysis increases in size, during pregnancy, with fairly characteristic changes which regress after labor, but never entirely disappear. Increase in size of the hypophysis is found also following castration and in the senium, according to some investigators.

The effect of the secretion of the gland on the uterus was first determined by laboratory experiments in 1909 by Kehrer and by Dale. Clinical possibilities were at once recognized,



and it was soon used to control post partum hemorrhage and as a prophylactic in Cesarean section. Two years later Hofbauer used the extract to stimulate and strengthen labor pains, since which time it has been widely employed for this purpose. Factors which have favored its free adoption are its relative constancy, permanency and uniformity of composition, in marked contrast with ergot.

The results are not uniform, but certain facts seem to be pretty well established. For example, the dose is about one-tenth of a gram of the gland substance, corresponding to one cubic centimeter of pituitrin, but varying somewhat with preparations of other manufacturers. Increasing the dose above this quantity does not seem to increase the action and such variations in result as appear seem to be due to variations in the susceptibility of the patients. For if the contents of a one cubic centimeter ampoule be divided equally between two patients, there may be a marked effect in one and no effect in the other.

It may be given subcutaneously, intramuscularly or intravenously. While there is little difference between the subcutaneous and the intramuscular injection, the latter method is generally preferred. It should be given intravenously only in an emergency to check post partum hemorrhage, for its action is not only almost immediate, but stormy and accompanied by unpleasant but not serious general symptoms. By mouth it has no effect. After intramuscular injection the action is evident in from five to fifteen minutes, though sometimes later; if there is no reaction from the first dose in half an hour, a second may be given. But if no reaction follows the second dose, the patient is considered refractory and no further injection should be made.

The effect on the uterus during labor is peculiar and characteristic, producing a type of pains which closely resemble the normal. There is an increase in the uterine tone, with an increase in the force of the contractions, and a shortening of the duration of the contraction as well as of the interval between the pains. The shortening of the interval is most marked at first when the pains may occur in such quick succession as to give rise to a tetanic contraction of several minutes' duration. But generally no tetanus results, the interval, though short, being clearly defined. The effect lasts for about an hour, with its acme in the first half hour, and is generally not followed by a period of noticeable relaxation. It seems more active the nearer the patient is to physiological term, and if in labor the nearer the patient is to the end of labor. But in inducing labor it is of no value.

In regard to its use after the birth of the child there is wide difference of opinion, indicating that more study and observation are necessary to clear up this aspect of the question. Its injection has been recommended at the mo-

ment of birth to diminish normal bleeding and is undoubtedly valuable for intravenous use in post partum hemorrhage, where it acts promptly and uniformly. Thus it removes the need for intrauterine manipulation and to that extent diminishes the danger of infection.

Certain reports on the use of pituitrin would lead us to think of it as almost a panacea, with no failures, no bad effects and no contraindications. But a more thoughtful study of cases and a review of the literature show that it sometimes fails and sometimes does serious harm.

The failures ought to be studied with great care. They may be divided into two groups: first, those in which there was no uterine reaction—found chiefly in elderly primiparae and in women with undeveloped uteri; second, those in which the reaction was not of sufficient force to produce the expulsion of the child. It is this second group that especially demands attention, for here are the cases in which the misuse has been most obvious.

The bad effects outside the uterus are occasional, but never serious, at least as hitherto reported, and consist of pallor, faintness, cyanosis and irregularity of the pulse. The serious bad effects are in causing tetanus of the uterus which had led to asphyxia of the child and occasionally to rupture of the uterus.

The indications for the use of pituitrin may be summarized briefly. But before it is administered a careful examination should be made to determine whether the child can be born through the birth canal. The cases of rupture of the uterus have come chiefly from the neglect of this precaution. If it seems probable that the child can be so born, pituitrin may be given, first, for uterine inertia in the first or second stage. It has been recommended for both primary and secondary inertia, but I am inclined to be very cautious in its use before the cervix is dilated two and one-half inches.

The second group of cases comprises several subdivisions: those cases in which labor pains are normal, but for some definite cause increased activity is needed, as in a breech and occasionally in a face presentation; if the disproportion between the presenting part and the pelvis is slight; to avoid exhaustion of the mother from undue prolongation of labor; in eclampsia in connection with dilating bag. The only indication that needs comment is the use in eclampsia. Some have feared the dangerous effect of the rise in blood pressure, but this is not great, and I think we have a choice of evils, of which I consider the rise of blood pressure less than the prolongation of labor. It may also be used as a prophylactic against bleeding in Cesarean section.

A word should be said about adrenalin in this connection. Its effect in producing uterine contractions was noticed in 1901, but the study was not prosecuted with much vigor at first, and later interest was distracted by pituitrin. But it is the most powerful and promptly acting



oxytocic that we have, causing contractions in dilution of one to two hundred millions, and producing a powerful effect in dilution of one to fifty million. It is contraindicated during labor because it produces tetanus, but for post partum hemorrhage it is prompt and efficacious though temporary in its effect. It is best injected into the uterine muscle, as intravenously it is dangerous and subcutaneously not very effective. Ten minims of the one to one thousand solution may be injected into the wall of the uterus as high as may be reached on pulling down the cervix.

## Original Articles.

### A STUDY OF THE SYMPTOMS AND TREATMENT OF CONGENITAL TRANSDUODENAL BANDS.

BY JOHN HOMANS, M.D., BOSTON,

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THE investigation, of which the results are here presented, has been undertaken to throw light upon the question whether transduodenal bands of congenital origin give rise to such symptoms as to cause them to be considered a pathologic entity, having a definite course, symptomatology, and treatment.

The most convincing exposition upon this subject was made several years ago by Dr. M. L. Harris.\* Following the teaching of various anatomists, he holds the bands to be remnants of the original anterior mesentery of the upper gut, which, persisting after rotation of the stomach and duodenum in foetal life, remain stretched from the gall bladder and inferior surface of the liver across the duodenum to the region of the hepatic flexure. In general, the cases described by Harris run a long course, their symptoms resemble in certain respects both those of gastric and duodenal ulcer as well as chronic gall-bladder disease, and the Roentgen examination gives evidence of dilatation of the first portion of the duodenum.

Having met with a number of instances of these bands or adhesions, it has seemed to me worth while to make a study of all such cases occurring over a period of several years at the Peter Bent Brigham Hospital. There are now available eleven cases in which definite bands passing from the gall bladder and liver across the duodenum have been found, and in which gastric or duodenal ulcers or gall-bladder disease have been held to be absent. The symptoms of these cases have been tabulated for comparison with a series of six duodenal ulcers

and six gastric ulcers, picked out at random, one combined gastric and duodenal ulcer, eight cases of chronic cholecystitis with and without stones, and two cases of chronic appendicitis with reflex gastric symptoms. The late results in all patients whose bands have been divided are of course known.

The lesion, as I have met it, can best be described by quoting from one or two operative records and by reproducing a sketch made at operation. The first: (Surg. No. 3934, J. McG., Case IX.)

"There were a number of adhesions, apparently of a congenital type, passing between the lower part of the gall bladder and the cystic duct across the duodenum to the region of the head of the pancreas. These did not appear to indent or constrict the duodenum. . . . There was another band of adhesions, narrow and rather tight, which passed from a point just proximal to the pylorus to the liver itself rather high up beneath the inner part of the right lobe mesial to the gall bladder. These adhesions made a slight constriction in the upper part of the duodenum at about the point indicated in the x-ray as the seat of ulcer. After dividing these adhesions it was possible to feel exactly the whole duodenum and pyloric region and no induration or deformity could be made out."

Or again (Surg. No. 4247, D.T., Case XI, Fig. ure I.)



FIG. 1. Duodenum, Case XI, D. T. (Surg. No. 4247). The same patient as in Case IX. The band of adhesion is shown by a dashed line. The band of adhesion is shown by a dashed line. A searchlight is shown in the upper part of the picture.

"At a point just below the pylorus a very broad band of what appeared to be congenital adhesions attached the gall bladder, from a point beginning at the cystic duct downward for perhaps an inch and

\* Harris, M. L.: Constrictions of the Duodenum Due to Abnormal Folds of the Anterior Mesogastrium. *Ann. A. M. A.* 1914, Vol. 18, pp. 1211-1216.



a half toward the fundus, to the hepatic flexure of the large intestine and to the inferior surface of the pylorus just above this point."

Or again: (Surg. No. 1759, M.A.S., Case III.)

"Extending from the region of the head of the pancreas to the lower border of the pylorus was a small scar-like band. Where this band came to the pylorus there was a larger and more stellate scar, which, however, was not in the stomach wall but in the peritoneum with fat under it, evidently not the result of an ulcer, but an old congenital band. From this scar ran a much stronger, rather funnel shaped band across the junction of the first and second portion of the duodenum to the neck of the gall bladder where it finally spread out over half the surface of the gall bladder. This band made a pronounced indentation in the duodenum, evidently causing a kink if not an absolute obstruction."

These bands as described have a strong family resemblance to those congenital remains not uncommonly found at autopsy in infants and others. The frequency with which they appear at autopsy is uncertain, but I am very kindly permitted by Dr. S. C. Harvey to quote from a paper as yet unpublished to the effect that among 105 infants a condition of this sort was found by him 20 times.<sup>†</sup> It is not pretended that these bands are pathologic or, indeed, that they necessarily give rise to any symptoms. Holding such bands to be the object of this investigation, and excluding simple exaggerations of duodenal fixation as well as adhesions obviously resulting from ulcer or cholecystitis, I have analyzed the symptoms of eleven cases which presented this condition at operation.

*Age and Sex.* There were six males and five females, the average age of both being forty-four years, the youngest nineteen and the eldest sixty-seven.

*Duration of Symptoms.* The average duration of symptoms was eight to nine years. Two patients had suffered with gastric disturbances for twenty years and one for only four weeks. Curiously enough the latter was the oldest in the series, sixty-seven. She had had pneumonia severely some months before and had been left with a weak, irregular heart. She failed rapidly after her gastric symptoms appeared and was thought to have cancer. A novocaine exploration revealed a transduodenal band constricting the duodenum. The band was divided, affording considerable relief from her digestive disturbances, but her general condition continued to decline and she died a month after leaving the hospital, of unknown cause (cardiac probably). The death of this patient before any

definite proof could be offered that division of the band had proved curative makes it doubtful whether the anatomic lesion was in reality responsible for the gastric symptoms. The x-ray studies before operation disclosed an atonic, dilated stomach and no irregularities in the outline of the pylorus and duodenum. If, then, the band was of any importance symptomatically it could only have affected the stomach in a reflex way in connection with the sudden enfeeblement of the patient from other causes.

*Character of Symptoms.* The gastric disturbances have been analyzed under the convenient headings of intermittency, food relief, vomiting and bleeding, but their general character as well may be compared with that of other lesions. The complaints include "sour stomach," epigastric discomfort, fulness and gaseous eructations, a dull ache in the epigastrium with exacerbations, and dull, aching pain in right side of the epigastrium with knife-like exacerbations. In general there has been no radiation. There has been night pain in some instances, and sometimes pain before breakfast. Comparing these complaints with those of duodenal ulcer, it appears that in many instances the complaint is similar to the familiar, dull, distressing ache and gnawing discomfort of the latter, but that the patients suffering from trans-duodenal bands have a greater variety of symptoms. In this respect they present more the picture of gastric ulcer, and again the irregular time of appearance of the pain or discomfort is more like that of gall stones, though with the latter a large proportion of cases have, beside their "indigestion," a history of characteristic radiating gall-bladder colic.

*Intermittency.* Out of eleven cases, five had some intermissions in the steady development of their symptoms. These were irregular and not at all noteworthy, only one case having a resemblance to the typical course of duodenal or gastric ulcer. In general, the patient's discomforts were steadily present, much more so than among the gall-bladder cases among whom four out of seven had had irregular intervals of freedom, and in marked contrast with the gastric ulcer group, in all but one of which, an acute case of one month's duration, periods of complete relief were marked, and to those suffering from duodenal ulcer, among whom typical remissions were the rule. In this respect the symptoms of trans-duodenal bands resembled exactly those due to chronic appendicitis as studied in only two well-marked cases. It appears, then, that in respect to remissions, the bands are responsible for symptoms resembling in their lack of periodicity those due to reflex causes.

*Food Relief.* In six of the eleven cases food relief was noticeable and when present was of fairly long duration. That is to say, it more resembled that of pyloric or duodenal ulcer than that of ulcer of the lesser curvature. In the other five cases in which it was absent, the dis-

<sup>†</sup>For reference to this and allied conditions, together with a presentation of the literature upon these congenital folds, the reader is referred to Dr. Harris's paper and to that of Dr. Harvey, presently to be published, entitled "Congenital Variations in the Peritoneal Relations of the Ascending Colon, Caecum, Appendix and Terminal Ileum."



comforts had no relation to the taking of food or were immediately excited by it. In the latter respect the band cases resembled the instances of chronic appendicitis with reflex gastric disturbances. When the pain or distress bore no relation to the taking of food there was a closer resemblance to the indigestion of gall-bladder disease. There was, then, evidence in regard to the relief afforded by eating, that this symptom was less common than in gastric or duodenal ulcer and much more common than in gall bladder or appendicular disease. When, however, food relief was present, it tended to resemble that of pyloric or duodenal ulcer.

**Vomiting.** This symptom is so erratic in its appearance in ulcer cases that a comparison of these small series is hardly of any value, yet it may be significant that in the band cases it was present six out of eleven times, in duodenal ulcer not at all in six cases, in gastric ulcer five times out of six, and in gall-bladder disease four out of seven times. The symptom of vomiting, therefore, brings out again a similarity to gastric ulcer or gall-bladder disease.

**Bleeding.** No history of hematemesis was obtained from the patients suffering from bands, blood was never found in the stomach washings, and in only one case was there a story of bloody or tarry stools. The history in this instance was considered unreliable as the patient had previously been told she had an ulcer and was inclined to make the most of her symptoms. If there had indeed been haemorrhage, the source was not found at operation, but on the other hand a very deforming trans-duodenal band (the most completely so in the series). This absence of bleeding is to be compared with the conditions in gall-bladder disease in which a history of tarry stools was noted in one instance, in gastric ulcer, with which it was noted five times out of seven, and in duodenal ulcer, with which it was noted twice out of six.

**Gastric Analysis.** The familiar measurement of the free hydrochloric and total acids in the gastric contents proved to be of no diagnostic value in this series. In some instances the acidity was low or normal, in two instances free hydrochloric acid was absent, in another it was high at one time and absent at another, and in several cases there was present a continuous secretion of free hydrochloric acid for a number of hours after the test meal.

**Röntgen Examinations.** Studies in gastric and duodenal motility and in the position and outline of the stomach and duodenum showed abnormalities in all instances of well developed trans-duodenal bands in which this examination was made. Of the eleven cases, however, nine only were studied, and of these, one, the woman of sixty-seven already noted as of doubtful importance, presented merely a low atonic stomach. The findings in the other eight may, however, be used as a basis for study. There were three instances of duodenal defects, two of dilations of the upper duodenum, one of hour-

glass stomach, one of normal duodenum with gastric hyperperistalsis and one of normal duodenum with atonic stomach. As a rule bismuth passed through the duodenum so rapidly as to make a record of duodenal irregularities difficult to obtain, but the pylorus was generally regular in outline.

The Röntgen findings are, therefore, much more like those of duodenal than gastric ulcer, the one exception being the instance of gastrospasm, which of course is more common as an accompaniment of the latter than the former. But even here the spasm was so variable that, not being accompanied by any typical ulcer defect, it was correctly attributed before operation to reflex causes outside the stomach.

**Diagnosis.** Before describing very briefly the individual cases, it may be interesting to assemble the pre-operative diagnoses which were as follows: (1) "Cholecystitis with adhesions," (2) "Cancer," (3) "Gall stones or gastric ulcer," (4) "Cholecystitis or duodenal band," (5) "Duodenal ulcer or appendix," (6) "Duodenal ulcer or band, plus cancer somewhere in abdomen," (7) "Chronic appendix, ulcer or constipation," (8) "Pyloric ulcer, question of cancer," (9) "Duodenal ulcer," (10) "Gall stones," (11) "Duodenal ulcer, question of duodenal band." This list makes a poor showing in respect to the accuracy of diagnosis in the presence of this condition. It may perhaps be summarized more intelligibly.

A diagnosis of duodenal ulcer was made four times and was twice bracketed with band.

A diagnosis of gall stones or cholecystitis was made four times; was bracketed with gastric ulcer once, with band once, with "adhesions" once.

A diagnosis of cancer was made once.

A diagnosis of gastric or pyloric ulcer was made once and cancer bracketed with it.

A diagnosis of chronic appendicitis, ulcer or constipation was made once.

This variety in diagnosis is to be contrasted with the six analyzed cases of duodenal ulcer in all of which a pre-operative diagnosis of duodenal or pyloric ulcer was made, and with the gastric ulcers, in all of which a correct diagnosis of gastric ulcer was made. As for the gall-stone cases, the correct diagnosis was made in all the eight cases picked out at random.

It appears, therefore, that cholecystitis, duodenal and gastric ulcers are not likely to be mistaken for bands, but that bands may simulate the appearances of these other lesions, especially duodenal ulcer and cholecystitis.

Finally, and in the light of these attempts at diagnosis, a reanalysis of the various symptoms shows that:

The general character of the patient's complaint tends to resemble that of ulcer or gall-bladder disease, but gives the impression of a reflex symptom complex.

In respect to intermittency, the symptoms re-



semble gall stones or chronic appendicitis rather than ulcer.

In respect to food relief, the symptoms resemble those of gall stones and chronic appendicitis rather than gastric or duodenal ulcer, but when food relief is present it simulates duodenal or pyloric ulcer in type.

In respect to vomiting the disease is rather like gastric ulcer or gall stones.

In respect to bleeding, band cases present negative findings.

In Roentgen ray studies the band cases tend strongly to imitate duodenal ulcer.

#### PROTOCOLS.

CASE I. J. McD. 565. November, 1913. A nervous, apparently hysterical woman of 38. Indigestion for nine years, constipation. Attacks of pain and distress suggestive of gastric spasm for two years. Recent loss of fifteen pounds in weight. Intermittency (of indigestion), none. Food relief, none. Vomiting, present. Bleeding, none. Chemical examination, normal. Roentgen examination, long, hook-shaped stomach, slight atony, normal pylorus and duodenum. Pre-operative diagnosis, "Cholecystitis with Adhesions." Operative findings, a normal stomach, tight pylorus, duodenum in general rather thick and firm, adhesions across duodenum to head of pancreas. Operative treatment, division of adhesions, pyloroplasty (Finney) during which, mucous membrane of duodenum was found to be normal. Result, immediate, incomplete relief. After several months, complete relief, good gain in weight. At present well.

CASE II. S. M. A. 1458. July, 1914. A worn-out woman who had never fully recovered from a recent pneumonia. Age 67. For four weeks constant pain in pubic region radiating to epigastrium, back, and both sides. Good appetite, constipation. Marked loss of weight. Intermittency, none. Food relief, none. Vomiting, none. Bleeding, none. Chemical, free hydrochloric acid absent. Roentgen examination: low, dilated atonic stomach, regular pylorus and duodenum. Pre-operative diagnosis: cancer, location undetermined. Operative findings (novocaine exploration), general visceroprosis. First portion of duodenum dilated. Band containing fat and blood vessels passing from gall bladder to hepatic flexure and lower border of pylorus constricted duodenum. Operative treatment, band divided. Result: improvement in digestion, increasing cardiac irregularity, high blood pressure and general debility. Death soon after leaving hospital (exact cause unknown).

CASE III. M. A. S. 1759. September, 1914. An apparently neuritic woman of 41. For six years steadily increasing distress coming on 1½ to 2½ hours after eating. Recently constant "burning" in epigastrium and dull aching pain. Frequent attacks of "faint feeling" with hunger in epigastrium. No loss of weight. Intermittency, none. Food relief, present in early stages, less now than formerly. Vomiting, present, not of food eaten. Bleeding, questionable. (Patient claims to have noticed bleeding since hearing that she had a gastric ulcer). Chemical, only a few drops of strongly acid fluid recovered. Roentgen examination: hypertonic stomach, deep peristalsis, pylorus and duo-

denum defined and regular. Pre-operative diagnosis, "Gall Stones or Gastric Ulcer." Operative findings, normal gall bladder and stomach, a broad band containing fat and blood vessels passes from gall bladder (indenting duodenum) to inferior border of pylorus and on from there to head of pancreas. No evidence of duodenal ulcer. Operative treatment, excision of band. Result, for a few days no relief. From then on while in hospital complete relief. Was operated upon a year later at another institution (appendix, haemorrhoids). June, 1916. States that her indigestion and attacks of "faint feeling" in epigastrium were relieved by the first operation. Confesses to a fondness for pastry, etc., and says that if she eats sensibly she has very little trouble. Looks well.

CASE IV. M. A. O'K. 2715. April, 1915. A normal appearing girl of 19. For four years "sour stomach" at times. For three months, dull ache in epigastrium with exacerbations. Intermittency, at first present, later absent. Food relief, none. Vomiting, occasional. Bleeding, none. Chemical: fractional meal, first hour normal HCl, second hour diminishing HCl. Roentgen examination: hour-glass stomach, deep peristalsis, normal pylorus and duodenum. Pre-operative diagnosis, "Cholecystitis or Duodenal Band." Operative findings, normal gall bladder and stomach, broad band passes from gall bladder across (but not indenting) duodenum to lower side of pylorus. Operative treatment, division of band and removal of atrophic appendix. Result, Stormy early convalescence, then complete relief while in hospital. Later, one or two milder attacks of epigastric pain (none for eight months) and now considers herself nearly but not quite well.

CASE V. H. C. H. 2803. April, 1915. A stout, pallid man of 41. For twenty years indigestion appearing one to two hours after eating, recently colicky pain at same interval and occasional fainting attacks. No loss of weight. Intermittency, present, as in duodenal ulcer. Food relief, present. Vomiting, occasional. Bleeding, none. Chemical, on several examinations, HCl increased or absent. Roentgen examination, gastric hyper-peristalsis, irregularity of first portion of duodenum (Figure II), giving impression of duodenal ulcer. Pre-operative diagnosis, "Duodenal Ulcer or Appendix." Operative findings, friable gastric wall with no evidence of ulcer, small tight pylorus, a stellate scar associated with vascular adhesion passing from lower surface of liver across duodenum which was firmly fixed to liver. No induration of duodenal wall. Scar thought to be an old ulcer. Operative treatment, gastroenterostomy with plastic on antrum for purpose of exclusion. Result, Death from bronchopneumonia. Autopsy, no evidence of duodenal ulcer even on careful microscopic section of duodenal wall.

CASE VI. G. F. S. 3193. June, 1915. A man of 56. "Sour stomach" for 20 years. For last six years attacks of violent pain in early morning, starting at umbilicus and radiating to left, followed by dull grinding sensation. All symptoms worse recently, and has lost ground. Intermittency, none for indigestion. Food relief, present to some extent for many years but not recently. Vomiting, formerly some, recently none. Bleeding, absent. Chemical, hypersecretion of HCl, increasing in





FIG. 11. Case V, H. C. H. Duodenal defect thought to indicate ulcer. At operation a band was found. At autopsy, three days later, there was no evidence of ulcer.

second hour. Roentgen examination, prompt emptying, normal outline of stomach and duodenum, stasis in second portion of latter. Pre-operative diagnosis (a mass was felt in abdomen, hard and fixed to left of umbilicus) "chronic duodenal ulcer or band and cancer elsewhere in abdomen." Operative findings. Normal stomach, typical, fan-shaped band from gall bladder across duodenum to head of pancreas—duodenum compressed but not creased. Cancer of pancreas (inoperable, the growth occupied the tail of the pancreas to left of median line). Operative treatment, division of band. Result. Stormy early convalescence followed by relief for several weeks, after which his condition rapidly declined, his indigestion returned, and he died at home three months after operation. No autopsy.

CASE VII. M. A. McC. 3588. September, 1915. A neurotic appearing man of 30. For three months gastric discomfort immediately after meals, dull aching pain to right of umbilicus, with knife-like exacerbations beneath right costal margin. Intermittency, absent. Food relief, absent. Vomiting, present. Bleeding, absent. Chemical, continuous low acid secretion for several hours. Roentgen examination had been made in another institution and was not repeated. Pre-operative diagnosis: chronic appendix, gastric ulcer or constipation. Operative findings: normal stomach, light band from middle of gall bladder across duodenum, normal looking appendix. Operative treatment, division of band, appendicectomy. Result. For several weeks nervous and complaining, later gradual steady improvement in all respects with return to work and gain in weight, but still has to exercise care in eating.

CASE VIII. S.A.D. 3712. October, 1915. A stout, rather prematurely old appearing man of 50. For 18 years, discomfort and gaseous eructations

following three to four hours after meals. Formerly some epigastric pain in early morning. Constant hunger. Constant diarrhoea for 12 years. Recent loss of weight. Intermittency, absent. Food relief, present. Vomiting, absent. Bleeding, absent. Chemical, constant anaclidity. Roentgen examination, hyperperistalsis and much dilated pylorus and first portion of duodenum. Beyond this point duodenum emptied rapidly and could not be outlined. (Figure III). Pre-operative diagnosis, chronic ulcer with question of cancer. Operative findings, stomach normal, pylorus large. First portion of duodenum enormous. Broad band from gall bladder across duodenum to hepatic flexure compressing but not creasing duodenum. Operative treatment, division of band. Result, prompt improvement steadily continued for ten months (to date). Has to take HCl for his diarrhea. Gain above normal weight.

CASE IX. J. McG. November, 1915. An ignorant, rugged man of 42, somewhat alcoholic. Epigastric pain 3, 4 or 5 hours after eating, not coming after every meal, often at night, recently replaced by discomfort and "rumbling" of gas. Soda relief. Recent loss of weight. Intermittency, present, irregular intervals. Food relief, present. Vomiting, absent. Bleeding, absent. Chemical, hypersecretion, highly acid, continuing over several hours. Roentgen examination, normal stomach, no stasis, defect in anterior upper part of duodenum (Figure IV). Rapid passage of food through duodenum. Pre-operative diagnosis, duodenal ulcer. Operative findings, two distinct bands: the upper from lower surface of liver ducts, and above gall bladder across first portion of duodenum collecting into pylorus; the lower, from gall bladder and cystic duct across duodenum to head of pancreas not indenting duodenum. Normal stomach and appendix. Operative treatment, band excised. Result, immediate improvement but not complete relief. Roent-





FIG. III. Case VIII, S. A. D. Huge dilatation of duodenum associated with a band. First portion of duodenum larger than pyloric antrum.

gen examination three weeks after operation shows duodenum more deformed than before (Figure V). Steady gain under careful diet. Six months after operation, well.

CASE X. I. M. H. 3945. December, 1915. A stout woman of 53, self-indulgent in eating and careless in habits of eating. For three years epigastric pain "dull and aching," coming on sometimes early and sometimes late after eating. Recently night pain. Intermittency, none in sense of

periodicity, but relief in periods of careful diet. Food relief, absent. Vomiting, absent. Bleeding, absent. Chemical, not made. Roentgen examination, only for gall-stones, thought to be present. Pre-operative diagnosis, gall stones. Operative findings, normal gall bladder and stomach. A broad fan-shaped band passes from gall bladder across (not constricting) duodenum to lower side of pylorus. Normal appendix. Operative treatment, band divided. Result, no improvement for 10 days. Then steady improvement with relief of symptoms



FIG. IV. Case IX, J. McG. Before operation. Duodenal defect associated with deforming band.





FIG. V. Case IX, J. McT. After operation. Note increase in deformity following operation as compared with Fig. 4. The band has been excised.

except on indiscretions of diet to which she is subject. Gain in weight.

**CASE XI.** D. T. 4247, February, 1916. A rugged man of 49. For 10 years dull pain two to three hours after eating. These symptoms were ushered in by two severe attacks of epigastric pain following indiscretions of diet. Soda relief. Has since been on careful diet. Gradual loss of weight. Intermittency absent, but there have been a few free in-

tervals. Food relief, present. Vomiting, absent. Bleeding, absent. Chemical, fractional examination shows irregular secretion of acid, high at end of first hour. Roentgen examination, gastric hyperperistalsis. Rapid passage of food through first portion of duodenum, making outline difficult to obtain, but plates show defect in first portion. (Figure VI.) Pre-operative diagnosis, duodenal ulcer, question of band. Operative findings, normal stomach, pronounced band from liver and gall bladder cross-



FIG. VI. Case XI, D. T. 4247, February, 1916. With Fig. I, a sketch of the band, the patient opened and to explain the band.



ing and indenting first portion of duodenum to lower side of pylorus (Figure 1). On opening duodenum, mucous membrane and wall found to be normal. Appendix could not be seen. Operative treatment, division of bands, Finney pyloroplasty. Result, stormy convalescence with attacks of vomiting, followed by complete relief, ability to eat anything, and gain weight. Four months after operation, perfect health.

*Treatment.* At first sight the treatment of this condition may seem simple and yet I am inclined to think that division of the bands, or even excision and the inversion of surfaces bare of peritoneum, may not always prove satisfactory. In two instances I have opened the duodenum and performed a Finney pyloroplasty with more completely satisfying relief than in the majority of cases in which the bands were merely divided or extirpated. In the first instance (Case I), upon whom I operated before the publication of Harris's paper, the pylorus was so firm and tight as to appear pathological and demand examination of the mucous membrane. There was, however, upon splitting the pylorus, no evidence of ulcer past or present, and a plastic operation was done to obviate any possibility of subsequent narrowing. In the other (Case XI) the Roentgen plates showed such a definite duodenal defect that though I felt that the band which indented the first portion must alone be responsible, yet I thought it only fair to the patient to open the bowel. Both mucous membrane and duodenal wall were completely normal and a plastic closure with widening of the pylorus was demanded by the character of the incision.

There may, however, be a good reason for the excellent results in these two chance observations. Carman\* has recently pointed out that duodenal defects accompanying ulcers are quite possibly due to spasm of the duodenal wall, and an operation which sets at nought spasm, often perhaps of many years' standing, may reasonably be expected to be more effective than simple removal of the originally exciting cause of the spasm. This conclusion is quite tentative, however, and it must be admitted that division or excision of bands without the plastic is quite satisfactory.

Another observation (Case IX) casts still more light upon the relation of the duodenal defect seen in the Roentgen plates to transduodenal adhesions and their treatment. In this instance the pronounced defect seen in the plates (Figure IV) made a diagnosis of duodenal ulcer appear obvious and yet at operation only a deforming band was found. Under full anaesthesia, the duodenal wall was so normal in appearance and so free from any sign of ulcer on palpation that it was not considered necessary to open the duodenum. Accordingly the band was divided and nothing more was done. Three weeks after operation, however, bismuth studies

showed more deformity than ever, and in the language of the Roentgenologist, "the duodenum appeared as an irregular sinus." (Figure V). There can be no question, therefore, that spasm alone was responsible for the duodenal deformity, band being the apparent cause, and it was the persistence and even accentuation of the deformity that caused me to open and explore the duodenum in a subsequent case (Case XI) and to perform a Finney pyloroplasty. A comparison of the Roentgen plates in these two cases will show the obvious similarity between them (Figures IV and VI), and indeed, the symptoms in each were much alike. The results, however, though too recent to be considered final, speak in favor of the plastic operation, though the patient, who was subjected only to division of the band, has steadily improved under careful diet and bids fair to be well.

*Results.* All cases but one have been followed for periods of two and a half years in the first case to four months in the most recent. Of the eleven, two patients died of other diseases within a few weeks or months of operation. Both were improved but not completely relieved of their gastric symptoms. Another patient died of bronchopneumonia immediately after operation.

Of the eight living patients who have been traced to the present time, all are well or so nearly so as to express themselves as satisfied with their condition. Several still have to exercise care in their diet. Division of the bands may be said, then, to have been curative, with this reservation,—that division of the bands plus a plastic operation (Finney) has given more completely satisfying results.

*Relation of Transduodenal Bands to other Lesions.* A great many surgeons who have met these bands at operation have undoubtedly regarded them as a chance finding which, though unimportant, has saved them from the ignominy of a negative exploration. Moreover, owing to the very generally "reflex" character of the symptoms in such cases, operators are perhaps inclined, in addition to dividing the band, if indeed they consider this worth while, to remove a questionably abnormal appendix or gall bladder, and are thus at a loss to place exactly the credit for such subsequent improvement as their patient may make. For this failure the very ease and safety of much of the present-day abdominal surgery is responsible, but it is to be hoped that greater surgical self-restraint, together with a more perfect coöperation between patient and surgeon in the study of late results, may clear up this and many similar matters.

It is such a feeling which has led me to refrain from opening the duodenum in certain of the cases of this series, and I have carefully explained to such patients that their future health is, so to speak, "sub judice." By giving the treatment of these bands a fair chance, one

\* Carman, R. D.: Spasm of the Stomach and Duodenum from a Roentgenologic Point of View, *Jour. A. M. A.*, 1916, Vol. LXV, p. 1282.



may indeed be able not only to add to our understanding of their pathology but to make an important contribution to our knowledge of duodenal ulcer with which the Roentgen studies in this series show the bands may be confused. In this respect Carman's recent exposition upon the subject of duodenal spasm seems to me particularly important. If duodenal defects, as seen in Roentgen examinations, are always to be held as due solely to ulcer, then trans-duodenal bands may be of little importance and can be held responsible for symptoms only when they obstruct the bowel. In other words, the failure to find ulcer in instances of duodenal defects accompanied by bands is due to the operator and not to the absence of ulcer. On the other hand, if bands themselves, through spasm, can be held responsible for duodenal defects, it is probable that many diagnoses of "duodenal ulcer," when a band is present, are incorrect. The evidence adduced by Carman, that duodenal defects are very generally spasmodic constrictions excited by ulcer, seems to me worthy of acceptance and in that case it is not too unlikely that a condition such as transduodenal band may bring about a similar spasmodic deformity. In the small Brigham Hospital series three instances of typical deformities were noted in the Roentgen studies and attributed before operation to ulcer. No ulcers were discovered at operation in these cases, which have already been described in full (Case v, Figure II; Case ix, Figures IV and V; Case xi, Figure VI). They, therefore, support the contention that bands, in the absence of ulcer, may, by exciting spasm, be responsible for the defects, and they even suggest that in the presence of a trans-duodenal band a diagnosis of duodenal ulcer must be made only on strong evidence.

#### CONCLUSIONS.

1. Congenital trans-duodenal bands may be responsible for symptoms "reflex" in type, which have, in spite of considerable divergence, a definite family resemblance.

2. Accompanying these symptoms the Roentgen findings very generally indicate duodenal spasm or dilatation of the first, or first and second, portion of the duodenum.

3. Division of the bands and appropriate treatment of raw surfaces is satisfactorily curative, but plastic operations to widen the opening into the duodenum probably give the best results.

4. Congenital trans-duodenal bands, judging from the frequency with which they are reported at autopsy, are not necessarily pathologic, but may be responsible for digestive disturbances having a recognizable symptomatology, a prolonged course, and appropriate operative treatment.

## INDICATIONS FOR WET PACKS IN PSYCHIATRIC CASES; AN ANALYSIS OF ONE THOUSAND PACKS GIVEN AT THE PSYCHOPATHIC HOSPITAL, BOSTON, MASSACHUSETTS.\*

BY HERMAN M. ADLER, M.D., BOSTON.

HYDROTHERAPY has been in use in psychiatric hospitals for a long time, and all sorts of methods and theories have been employed with more or less success. Of late years, since the more modern ideas about hydrotherapy have gained the upper hand, elaborate provisions have been made in up-to-date hospitals for the application of Scotch douches, shower baths, needle baths, and so forth, whose effect has been reinforced by the use of steam baths, electric light baths, hot air, massage, and mechano-therapy.

The favorable experience of Kraepelin with the prolonged bath, which has been corroborated by numerous hospitals all over the world, served to establish this method as one of the necessities of a modern psychiatric clinic. Wherever the baths are consistently and intelligently given, strikingly good results have been observed.

Indications for giving baths have not, however, been very definitely set, so that the custom differs somewhat in the various hospitals where prolonged baths are given in the routine fashion. In general, the chief indication for giving a prolonged bath is restlessness. A patient becomes excited, noisy and violent, and is placed in a prolonged bath. Indications for the pack, on the whole, are the same as for the bath, except that the pack is especially indicated when the patient's ability to cooperate, or his suggestibility, is reduced to a negligible quantity. Mere excitement does not mean necessarily that hydrotherapy should be resorted to. It has been established that the chief signs are loss of body heat and loss of water.<sup>1</sup> These two apparently go hand in hand, and cyanosis of the exposed portions of the body, especially the face, hands and feet, is an index of the rapidity and the extent of the process. Hydrotherapy conserves the body temperature. It prevents the evaporation of water from the skin. It probably replaces some of the water lost, and it offers a gentle, mechanical restraint against sudden or violent gestures or motions.

The wet pack, as it is usually given, consists of a number of sheets wrung out in water at about 100 F., and wrapped tightly around the patient's body and limbs, so that he cannot move anything except his head, fingers, and toes—and an outside wrapping of blankets pinned with large safety pins, so that the patient cannot pull out of them. When the patient is so restless and active that in spite of

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this, he is likely to fall out of bed in consequence of a flexion and extension of his entire body, a restraining sheet or blanket is placed over him and pinned to the sides of the bed, and the foot end of the pack may be attached by means of a blanket and safety pins to the cross bar at the foot of the bed. In this way, the patient is completely trussed and practically immobilized. In fact, this is so obvious, and the change from the violent agitation to the immobilization caused by the pack is so striking, that it must appear to many that the chief object of the pack is restraint, and is quite comparable to a strait-jacket or any other forms of restraint. As we shall see later, nothing can be further from the truth than this conception, and yet the similarity seems so great that even the attendants and nurses—not to say the physicians—frequently treat the pack as a form of restraint, and order it as a means of relief for themselves or the other patients from the disturbances caused by one who is merely noisy.

Where the degree of excitement is such that the gentle effects of the prolonged bath are not adequate, the restraining influence of the pack may be required to put the patient in the condition for the prolonged bath. The wet pack is applied for two hours. The patient is then removed whether he be still disturbed or not. If the patient has not fallen asleep or is not completely restored to quiet and self possession, he is then placed in the prolonged bath.

The ideal temperature for the prolonged bath is not over 98°F and not under 95°F. The water should be kept continually at this temperature, and the body should be immersed as far as possible in the water. The object of the pack is to produce an envelope of water or moisture-laden air at body temperature, and maintain this for the length of the pack. It has been shown that whether we start with cold water or warm water, the temperature of the pack readily adjusts itself to that of the body.<sup>2</sup> In cases of maniacal excitement, even though the patient may have fever, the surface of the body is losing large amounts of heat. It is wise, therefore, to start with hot sheets rather than cold sheets,—the idea being to conserve as much of the body heat as possible.

The patient should be given water to drink freely throughout the pack, and an ice-cap should be placed upon the head, and a cold compress on the forehead, which should be frequently renewed.

In cases of alcoholism or drug addiction, or in cases that have been exhausted by prolonged febrile diseases, there is a certain amount of danger from collapse in the pack. Following the experience in European clinics, as well as in this country, a hypodermic injection of digipuratum, or digitalin has been given almost as a routine in these cases. The ordinary preparations of digitalis such as the powdered leaves, the tincture or the extract, require sometimes as much as twelve hours before the effect is ob-

tained. They are, therefore, useless for this purpose. The hypodermic preparations are much more prompt in their action, and have given excellent results. Since the outbreak of the war, however, it has been impossible to obtain these drugs except at prohibitive prices, and stimulation with strychnin or camphor has been resorted to in cases in which there seemed to be a danger of cardiac collapse.

While the physicians who have been employing the pack in a proper fashion have all become convinced of the fact that it is a valuable therapeutic measure and in no sense to be compared to mere restraint, they have found this difficult to prove in individual cases; and in the face of charges brought by paranoid patients or their relatives, they have found it difficult to convince a prejudiced by-stander of the difference.

With these ideas in mind, a closer study was made of a thousand packs that had been given in the course of routine management of the patients at the Psychopathic Hospital, and the results of this study are herewith presented. These cases were gathered from unselected clinical material in the order in which they were given, and represent 309 patients. As will be seen from the table, the diagnoses, organic and psychiatric, comprise a large variety, and only one factor was taken into consideration in the present analysis, namely,—whether the patient was quieted by the pack or not.

According to this analysis, out of 309 cases, 155 were quieted by the packs, 56 were not quieted by the packs, 98 were quieted by some and not quieted by others, or, in other words, had a partial effect.

For the sake of convenience, I have grouped only the main classifications together. It will be seen that cases diagnosed manic depressive insanity and dementia praecox are very nearly equal in number—79 of the former, 82 of the latter. But 326 packs were given in the 79 cases of manic depressive insanity, with a quieting effect in 144, without quieting effect in 218 packs, whereas in the 82 dementia praecox cases, only 217 packs were given, with quieting effect in 143, and without quieting effect in only 74.

The same disproportion is shown by the cases of manic depressive insanity showing agitated depression. In 8 cases 26 packs were given, 8 with quieting effect, 18 without quieting effect. In all the other groups, including general paresis, delirium tremens, alcoholic hallucinosis, and epilepsy, by far the majority of packs had a quieting effect.

It would seem, then, that excitement in conditions other than manic depressive insanity is to be considered rather as a secondary manifestation, and one which is more easily controllable by hydrotherapy. Even in the cases of manic depressive insanity, of course, a quieting effect was obtained a large number of times, but the packs that were given without quieting effect outnumbered those that had a quieting



effect, indicating, thereby, also that the duration of the state of excitement and the intensity of the excitement are greater than in the other diseases.

These results are quite different from those obtained by the use of restraint without hydrotherapy. It is unnecessary here to recall the remarkable improvement in the condition of excited patients produced by the modern methods of non-restraint, in which diversion and occupation take the place of padded cells, strait-jackets, and strong rooms.

More to the point, perhaps, will be the startling figures obtained in a study of the treatment of delirium by hydrotherapy at the Psychopathic Hospital, Boston, compared to the results of the older methods of restraint and depressing drugs without hydrotherapy, employed at general hospitals. The mortality in general hospitals averages 26 per cent., the mortality in the Psychopathic Hospital, under hydrotherapy, more especially packs, averages 0 per cent.<sup>2</sup>

On account of these facts, it is safe to infer that hydrotherapy, whether applied in the form of prolonged baths or as wet packs, has a therapeutic effect, which is not to be obtained by mere immobilization of the patient or by restraint.

The question of restraint, of course, is an important one for administrative reasons. However, these figures prove that the wet packs not only cannot be condemned for reasons of cruelty, but that they are the most potent means of obtaining rest for a maniacal patient. The wet pack has been used at the Psychopathic Hospital consistently as an auxiliary to the prolonged bath, and bears the same relation to the latter that hypodermic medication bears to medication *per os*. A patient who cannot or will not swallow medicine may still derive the benefits from the drugs when they are administered subcutaneously. A subcutaneous injection of heart stimulant, for instance, may be applied against the wishes of an insane person. It may be applied in cases of unconsciousness and so forth. It offers a means of applying a therapeutic agent without the cooperation or even the consent of the patient. In the same way, the pack may be used to administer the beneficial effects of hydrotherapy, and in particular, of the prolonged bath, to patients who are so restless or excited that they cannot be induced to submit to the prolonged bath.

DIAGNOSIS	No. of Cases	No. of Packs	QUEDS FEDS	QUEDS FEDS
Dementia Praecox.....	82	217	113	74
Manic-Depressive Insanity:				
Manic.....	71	336	136	200
Depressed.....	8	26	8	18
Alcoholic Hallucinosi.....	20	49	28	12
Delirium Tremens.....	20	34	21	13
Alcoholism.....	5	7	6	1
Organic Dementia.....	4	11	7	7
Senile Dementia.....	1	6	5	1
Involution.....	3	1	1	0
Epilepsy.....	8	14	12	2
Paraphrenia.....	2	3	3	0

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## JOHN CLARENCE CUTTER, M.D.

BY SARAH H. POWERS.

DR. JOHN CLARENCE CUTTER was born in Warren, Massachusetts, July 10, 1851, eldest son of Dr. Calvin Cutter, the author of Cutter's Physiology, and Ennie Powers, a woman of the old school of culture.

After he received his education in the public schools of Warren, he entered the Agricultural College at Amherst, from which he was graduated in 1872. He spent a year in J. B. Lippincott's publishing house, then attended Dartmouth Medical School for two years, from which he went to Harvard Medical School, where he was graduated in 1877. Before he received his diploma he had gained the post of house surgeon in the City Hospital.

In 1878 he went to Japan to accept the position of professor of physiology and comparative anatomy in the College of Agriculture, Sapporo, Island of Yezo. When he arrived at Tokio he was made the consulting physician of the Imperial Colonial Department. His first contract with the government was for two years. He was liked so well, that he renewed it from time to time until he had been with the college nine years. At his mother's urgent request, he did not renew his contract in 1887, but came home through Europe. Before leaving Japan, the Emperor conferred on him the Order of the Rising Sun, Meiji, fourth class.

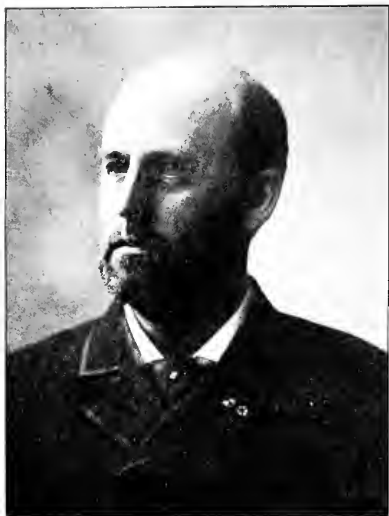
While in Japan, Dr. Cutter wrote several physiologies which were translated into Japanese. After his return home, he revised his father's books, which had been translated into thirteen different languages and printed in raised letters for the blind.

In 1888 he went to Berlin and Vienna to study skin diseases. In the fall of 1890 he opened an office in Worcester. Soon after coming to Worcester, while assisting another physician in performing an operation, he contracted blood poison from which he never fully recovered.

Dr. Cutter came from a long line of famous ancestors on his mother's side, born in Warren. In Colonial times, they were foremost in the life of the town; they fought in the Indian Wars, in the Revolution, in the War of 1812 and the Civil War.

Dr. Cutter was energetic and possessed of forcible character. He had the courage of his convictions, and his fearlessness counted much





JOHN C. CUTTER, M.D.,  
Sapporo, Japan, 1884.

in accounting for the honors thrust upon him abroad."

One of his peculiarities was that he never turned the conversation on himself, so that very few knew the facts of his career. To a few intimate friends only would he allude to his travels or life in the Orient. After his mother's death in 1893, he gave up his practice and spent the following winter in Mexico and California. In fact (for the next three years) he traveled most of the time in the United States. He said he had been in every state and every territory but one in the Union. He was very fond of travel and said a train of cars had a peculiar fascination for him. In 1897 he received a shock, which left him with partial paralysis. It also affected his eyesight and memory. Several winters during his illness he spent with Dr. Robert I. Edes, in Boston. Although an invalid, he retained his interest in affairs of the world. He was particularly anxious to have us read to him the happenings in the medical world.

He did not remember what took place from day to day, but still could talk intelligently on most subjects. It seemed sad to see him, with a bright outlook and much good work planned, in such a condition, stricken in the prime of life. He was very patient, and never complained. When anyone alluded to his trouble, he would reply, "It is all right, it was to be. It had better be I than the other man, who has a wife and children. I have neither." He died February 2, 1909, of cerebral hemorrhage, after twelve years' illness.

He was straight and honest in all his dealings and wished others to be the same.

When his father died, he left debts to the amount of several thousands, all of which the doctor, with his mother's help, paid dollar for dollar, also the interest. When asked by one of his classmates why he did it, he replied, "I do not care to have people say, 'Oh! he got his education—and his father's debts not paid.' I'll have a clear conscience."

In his will he left the old home and land to the town of Warren for a children's playground, which was the first bequest of its kind, so far as is known, in this part of the country; to the Library Association, his books and some of the curios he had collected in the Orient, also his decoration from the Emperor of Japan, which he valued the most of all his many gifts that he received while professor in the Agricultural College at Sapporo, Japan.

His surgical instruments and his microscope were left to the City Hospital, Boston, Massachusetts. A sum of money, 1000 Japanese silver yens, equivalent to \$500, was given to the college at Sapporo, Japan, for a drinking fountain, suitably inscribed, to be placed on the college grounds; the income of \$1000 to the Agricultural College in Amherst, Massachusetts, to purchase books on hygiene.

To the Loyal Legion, Boston—curios of John Brown times.

After a few other bequests to relatives and friends, the residue of the estate was left to Harvard Medical School.

The remarkable scope of the testator's ideas is shown in the use assigned to the income of the property. It is a fund for maintaining a Cutter Lectureship on Preventive Medicine, one of the first bequests for such a purpose; these lectures to be free to all medical men, and to representatives of the press.

As specified in the will, the following inscription has been chiseled on the family monument in Pine Grove Cemetery, Warren, Massachusetts.

"JOHN CLARENCE CUTTER, B.Sc., M.D.  
Meiji IV Japan  
July 10, 1851  
February 2, 1909"

In closing this sketch of Dr. Cutter's life, there are two incidents which may reveal a little of his character.

As he was consulting physician and surgeon to the Imperial Government, he was not allowed to take fees, but could accept presents, and many of his rare curios were gifts from grateful patients. One of these is a rare specimen of ancient porcelain, which the owner, an old man, gave as the most valued of all his possessions. A bit of amusing history is connected with this gift. The old man had a young wife, who, as the doctor thought, preferred to have her spouse called to a higher life. The doctor set himself



to work to cure the old man who was so pleased that he gave him the ancient porcelain. While in Japan, the railroad from Otaru to Sapporo was built. Soon after it was completed, the doctor had occasion to take the train to go to a town, a short distance down the line. When out a few miles, the engine jumped the track. The Japanese did not know what to do. The doctor, who watched them in their efforts, finally asked for jack-screws and described them. They were found, and with his assistance, and directions to the Japanese, the engine was back on the track. They looked at him in amazement, and asked, "Do all the men in America know how to do everything?" He told them that most boys where he lived were taught many things, but not everything. The engine was very small compared with those in this country even at that time.

But the incident illustrates the resourcefulness of the man, which helped to win for him the admiration and confidence of those about him.

## Clinical Department.

### SYPHILIS OF THE LUNGS.\*

By NATHANIEL K. WOOD, M.D., BOSTON.

THE finding of extensive dullness of the lungs during routine examinations in cases that did not show tubercle bacilli in the sputum has interested me to collect data that would point to some other cause than tuberculous for such dullness.

At the same time the recognition of the Spirocheta pallida and the discovery of the Wassermann test have proved pathological findings, not heretofore recognized as such, a manifestation of syphilis. A striking example of what I mean is aortitis. Therefore, the question suggests itself, can the prevalence of lung dullness be correlated with the prevalence of syphilis? Can sufficient evidence be found clinically to justify a diagnosis of syphilis of the lungs? Is that evidence of sufficient weight to convince the pathologist that he is overlooking something, or calling something already seen by a wrong name?

From twenty-two cases, I have selected a series with histories suggestive of syphilis, whose physical examination showed definite lung impairment. If the Wassermann test proved positive, I had sputum examinations made and von Pirquet tests tried. If these proved negative, I had radiographs taken of the chest and long bones of the lower leg. I was able to select seven cases that showed definite histories, definite lung impairment, positive Wassermanns, negative sputum and von Pirquet tests. To these were added four cases which did not meet the

above requirements. One had a few tubercle bacilli in the sputum, Gaffky No. 2, but had in addition a markedly positive Wassermann test and definite radiographic findings. The three others were children, upon whom the diagnosis of tuberculosis had been made and who had been carefully treated for tuberculosis several years. Repeated examinations of their sputum have shown no tubercle bacilli, but their family histories were strongly suggestive of syphilis. No Wassermann tests or radiographs were made upon them, but I wish to cite them because of the marked effect which mixed treatment had upon them.

CASE 1. W. J., Male, January 29, 1915.

*F. H.* Could not be obtained.

*P. H.* Gonorrhea twice. Hard chancre.

*P. I.* Pains in abdomen. Cough and expectoration. Constipation.

*P. E.* W. d. & n. Skin negative. M.M. pale. Teeth bad. General glandular enlargement.

*Lungs.* Marked dullness in upper 2/3 and moderate dullness lower third, in front. Rare crackles left top. In back, few medium crackles above the spine scapula. Harsh respiration from the apex to the angle of scapula. Right back, diminished respiration upper half with few dry râles. Fairly good respiration lower half.

*Heart.* Not enlarged. Action regular. First sounds weak. No murmurs. P<sup>+</sup> plus.

*Liver.* Edge felt 1½ cm. below costal margin. Old scar of the penis.

*Sputum.* Negative.

*Von Pirquet.* Negative.

*Wassermann.* Positive.

*Radiographic Findings.* Clavicles, lower ribs and tibiae show periostitis and endosteitis.

*Chest.* Aortitis. Infiltration lower third right lung.

*Weight.* 125 pounds.

*Treatment.* Tr. nux and gentian before meals. Mercury and potassium iodide after meals.

July 31, 1915. Has had a good month. No pain in abdomen for six weeks. No cough. Bowels move well. Eats and sleeps well.

*Weight.* 132½ pounds.

*Lungs.* Dullness in front remains the same. Respiration distinct. Fair excursion. Rare dry râles at apex left side. In back, dullness has decreased on the right side. Respiration is heard easily, excursion good, no râles. On left, broncho-vesicular upper half. Good lower half. Few dry râles, upper half.

February, 1916. Has improved since last note. Weight, 135.

CASE 2. C. M., female, 55 years old. Single. March 19, 1915.

*F. H.* Father and mother died when she was very young. Six brothers or sisters died before one year old.

*P. H.* Heart and kidney trouble 7 years.

*P. I.* Loss of appetite and strength, pains in joints, headaches, constipation, chronic cough with expectoration and shortness of breath. Poor memory.

*P. E.* W. D. p. c. n. Skin pale. M. M. pale. Teeth poor. General glandular enlargement. Chest small and flat. Clavicles and ribs prominent.

*Lungs.* Marked dullness both lungs throughout.

\* Read before the American Climatological and Therapeutic Association at Washington, D. C., May 31, 1916.



right more than left. Bases filled with moist râles. Musical râles the upper half. Respiration faint over upper half. Poor excursion throughout.

*Heart.* Right border 4 cm. to right of mid-sternal line. Left border, 13 cm. to left of mid-sternal line. Action very irregular, sounds faint, no murmurs.

*Liver.* Felt 2 cm. below costal margin. Oedema of ankles.

*Sputum.* Negative.

*Von Pirquet.* Negative.

*Wassermann.* Positive.

*Radiographic Findings.* Both fibulae show periostitis. Chest, very large heart.

*Weight.* 157½ pounds.

*Treatment.* Tr. nux and gentian before meals. Mercury and potassium iodide after meals.

March 25, 1915. Feels very much better. Very little cough. No oedema of ankles. Less headache.

*Lungs.* Few medium dry squeaks scattered over entire right and rare dry râles over left.

February 5, 1916. Slow and steady improvement. Looks and feels decidedly better.

*Weight.* 168. Memory improved.

*Lungs.* Few rare, sonorous râles in upper half of both fronts and over the entire back. Dulness the same.

*Heart.* Slightly irregular. A short presystolic murmur has developed.

CASE 3. W. P., male, 35 years old. Married. February 23, 1915.

*F. H.* Father died of tuberculosis. Mother alive and well. Two sisters died as babies. Four brothers and one sister alive and well.

*P. H.* "Brain fever" at age of 13. Rheumatism twice, last time 8 years ago. Several quinsy sore throats. Has two children, both poorly developed and poorly nourished. Has lost no children.

*P. I.* Ten weeks ago spat up one-half cup of blood. Blood streaked sputum for next three days. No more blood until three days ago. Since then blood streaked sputum. Cough for one month before first hemoptysis, then none until five days ago. Best previous weight 141, 16 years ago.

*P. E.* F. d. & p. n. Skin pale. M. M. pale. Teeth poor. Glandular enlargement marked. Chest narrow. Clavicles prominent.

*Lungs.* Marked dulness upper two-thirds of both lungs in front. Broncho-vesicular respiration right top. No râles in front. Marked dulness both backs throughout. Broncho-vesicular respiration upper half. Diminished respiration lower half. Few medium crackling râles left back from angle of scapula to base.

*Heart.* Right border right edge of sternum. Left border, nipple line.

*Liver.* Not felt.

*Sputum.* Negative.

*Von Pirquet.* Positive.

*Wassermann.* Plus plus.

*Radiographic Findings.* Clavicles, three lower ribs, tibiae show periostitis and endosteitis.

*Chest.* Infiltration both apices.

*Weight.* 127 pounds.

*Treatment.* Tr. nux and gentian before meals. Mercury and potassium iodide after meals.

March 6, 1915. Tubercle bacilli found in sputum. Gaffky No. 2.

*Weight.* 126½ pounds.

*Treatment.* Idem. Patient allowed to continue at work.

April 14, 1915. No tubercle bacilli found in sputum. Feeling very good. No blood streaked sputum since February 26, 1915. Coughs much less and raises only in the morning.

*Weight.* 132 pounds.

April 28, 1915. Feeling very well. Coughs rarely and only when he has to raise sputum. Raises less than one drachm in 24 hours.

*Weight.* 136½ pounds.

*Lungs.* Dulness upper half both lungs in front. Good respiration. Few to rare, fine and medium stretching sounds both bases. In back, dulness persists. Diminished respiration lower two-thirds on left. Rare medium, stretching sounds at base. On right, diminished respiration lower half, fairly deep respiration, rare stretching sounds scattered all over back.

*Sputum.* No tubercle bacilli found in sputum.

June 9, 1915. Says he feels as well as he ever did in his life. No cough, no expectoration.

*Lungs.* Respiration good. Excursion good. No râles heard.

*Weight.* 141 pounds.

August 3, 1915. Weight 143. Slight cough in the morning.

February 3, 1916. Has taken no medicine since August. Has felt well until the last few weeks. Now has choked up feeling in chest. Is coughing and raising.

*Weight.* 133 pounds.

*Lungs.* Marked diminution of dulness throughout both lungs. Front right apex rare fine crackle. Rare dry râles left apex. Good respiration. Good excursion. Back, diminished respiration left top. Rare, fine and medium stretching sounds upper half. Rare, fine and medium stretching sounds with cough to mid-scapula on right. Good respiration and good excursion entire right side.

*Treatment.* Resumed mixed treatment.

March 9, 1916. Weight, 136 pounds. Choked up feeling has disappeared. Cough and raises rarely.

CASE 4. M. C., female, 35 years old, married. March 10, 1915.

*F. H.* Father and mother living. Two brothers and five sisters living. Three brothers died in infancy before two years old.

*P. H.* Has had seven children. Three have died, one with diphtheria, two mal-nutrition, ages four and five months respectively.

*P. I.* Past four weeks headache and nausea. Poor appetite. Fatigue. Very constipated. Best weight 112, 15 years ago.

*P. E.* P. d. & n. pale. M. M. pale. Teeth bad. General glandular enlargement. Chest small. Clavicles prominent.

*Lungs.* Marked dulness throughout both chests. Faint respiration. Limited in excursion. Whispered voice plus over the right upper lobe. Rare, dry squeaks right mid back.

*Heart.* Right border mid-sternal line. Left border one finger breadth inside nipple line. Sounds weak at the base. No murmurs. P<sup>+</sup> plus.

*Liver.* Not felt.

*Sputum.* Negative.

*Von Pirquet.* Negative.

*Wassermann.* Positive.

*Radiographic Findings.* Bones show nothing. Chest shows nothing.

*Weight.* 85 pounds.

*Treatment.* Tr. nux and gentian before meals. Mercury and potassium iodide after meals.



June 30, 1915. Weight, 88 pounds. General condition much improved. Pale and under weight.

*Lungs.* Dulness persists in lungs. Respiration fairly good in front. Diminished in back. Excursion good in front and fair in back. No râles.

March 14, 1915. From December 4, 1915, to January 27, 1916, was given injections succinamide of mercury, gr. one-fifth. Since then has felt very well.

*Weight.* 94 pounds.

*Lungs.* Continue to show dulness, but good respiration.

CASE 5. E. W., female, 36 years old, married. April 8, 1915.

*P. H.* Negative.

*P. H.* Asthma and bronchitis several years.

*P. I.* Cough all winter. Poor appetite. Loss of 10 pounds last few months.

*P. E.* F. D. f. n. M. M. male. No glandular enlargement. Chest barrel-shaped.

*Lungs.* Marked dulness throughout both, especially upper two-thirds. Harsh respiration throughout. Some to few, medium and coarse wheezing râles over entire chest, front more than back.

*Heart.* Cardiac area normal. No murmurs.

*Sputum.* Negative.

*Von Pirquet.* Negative.

*Wassermann.* Positive.

*Radiographic Findings.* Bones show nothing. Chest shows nothing.

*Weight.* 107 pounds.

*Treatment.* Tr. nux and gentian before meals. Mercury and potassium iodide after meals.

July 30, 1915. Temp. 99.2. Weight, 112½ pounds. Feels very much better. No cough. Has raised nothing for eight weeks.

*Lungs.* Much less dulness. Right front few, fine and medium squeaking râles with cough, scattered over entire side. On left, rare, fine and medium, dry squeaks with cough scattered over upper half. In back, few fine, medium and coarse squeaking râles with cough scattered over both sides, top more than base.

September 2, 1915. Weight, 119½ pounds. Feels very well. No subjective symptoms referred to chest.

*Lungs.* Clear throughout.

CASE 6. G. A., male, 22 years old, single. Mar. 26, 1915.

*P. H.* Negative.

*P. H.* Severe pneumonia in childhood affecting left side. Gonorrhea and chancre.

*P. I.* Bad cough for two months. Feels weak. Has lost 10 pounds in two months. Occasional night sweat. Raises thick, yellow sputum.

*P. E.* W. D. & N. Good teeth. General glandular enlargement. Chest, good size.

*Lungs.* Very marked dulness over entire left side and marked dulness upper two-thirds of right. Moderate dulness lower third. Faint respiration over left side. Râles scattered throughout left.

*Heart.* Right border mid-sternal line. Left border not determined.

*Liver.* Edge felt. Is tender.

*Sputum.* Negative.

*Von Pirquet.* Negative.

*Wassermann.* Plus plus.

*Radiographic Findings.* Periosteitis of bones suggested. Chronic pleuritis of left lung.

*Weight.* 122 pounds.

*Treatment.* Tr. nux and gentian before meals. Mercury and potassium iodide after meals.

May 25, 1916. Has improved but little. Feels weak and tired. Pain in the left axillary region.

*Lungs.* Dulness persists. Good respiration on right side. Few to rare, fine clicks scattered over lower half. Left front, bronchial respiration fourth space. Some to few, fine and medium, sticky râles or pleuritic rubs with cough. Left back, few, fine, medium sticky râles with cough to spine. Some fine, medium and coarse friction rubs from spine to angle. Few fine and medium, pleuritic rubs from angle to base.

April 13, 1916. Has taken treatment regularly. Wassermann test negative. Weight, 142 pounds. General condition excellent. No cough. No expectoration.

*Lungs.* Marked dulness persists over left. Some dulness on right. From above downward on left, few, some to considerable fine, medium and coarse friction rubs front and back. Few, fine friction rubs at base of the right.

CASE 7. C. S., female, 52 years old, married. October 1, 1914.

*P. H.* Husband died, shock, age of 63.

*P. H.* Has had six children. One died at three months, one at five months, one at one and one-half years old. The latter, however, of diphtheria. Dizziness and headaches occurred at three or four days' intervals for several years.

*P. I.* Increasing attacks of the above. Dizziness is more severe and lasts longer.

*P. E.* W. d. & f. n. Glandular enlargement. Poor teeth. Chest small. Clavicles prominent.

*Lungs.* Show slight dulness upper half and front and marked dulness from the spine to the angle of scapula both backs. Rare, dry râles left back.

*Heart.* Right border, right edge of the sternum. Left border, nipple line. Loud systolic murmur at apex transmitted to axilla.

*Liver.* Edge felt.

*Sputum.* Negative.

*Von Pirquet.* Negative.

*Wassermann.* Positive.

*Radiographic Findings.* Periosteitis and endosteitis of the tibia. Chest, aortitis.

*Weight.* 135 pounds.

*Treatment.* Tr. nux and gentian before meals. Mercury and potassium iodide after meals.

June 21, 1915. Feels very much better. Very little headache. No dizziness. Sleeps well. Weight, 146½ pounds. Chest examination practically the same.

July 26, 1915. Has taken no medicine for four weeks. Feels well. Weight has dropped, however, to 140½ pounds.

*Lungs.* Clear throughout. Good respiration. Good excursion.

January 21, 1916. Has taken medicine irregularly. Feels rather poorly. Weight, 140 pounds.

May 1, 1916. Has taken medicine regularly last two months. Weight, 142½ pounds. Feels very much better. Lungs perfectly clear.

CASE 8. M. G., female, 37 years old, married. colored. April 22, 1915.

*P. H.* Negative.

*P. H.* Two children. Two gonorrheas.

*P. I.* Twelve years' pain in left lower quadrant. Worse on exertion and when constipated. Loss of 12 pounds in last five months. Slight cough and expectoration.



*P. E. W. D. & W. N.* Teeth bad. No glandular enlargement.

*Lungs.* Moderate dulness upper two-thirds of both. Good respiration. Good excursion. Few scattered râles right back.

*Heart.* Right border, right edge of sternum. Left border, nipple line. Systolic murmur over the right side of the heart at apex, not transmitted to axilla.

*Abdomen.* Tenderness lower left quadrant. Tube?

*Sputum.* Negative.

*Von Pirquet.* Negative.

*Wassermann.* Positive.

*Radiographic Findings.* Tibiae suggestive. Aorta suggestive. Heart very large.

*Weight.* 167½ pounds.

*Treatment.* Tr. nux and gentian before meals. Mercury and potassium iodide after meals.

May 27, 1915. Has had occasional night sweats. Does not cough. Raises nothing. Sleeps poorly. Lungs show good respiration. Good excursion. No râles.

July 24, 1915. Weight, 170 pounds. Feels much better. Says she has some pain in her chest, but says that her respiration is deeper than formerly.

*Lungs.* Rare stretching sounds over lower half of back.

February 24, 1916. Has done well all winter.

*Weight.* 174 pounds.

*Lungs.* Show good excursion, good respiration. Scattered stretching sounds.

CASE 9. L. A., boy, 10 years old. December, 1911.

*F. H.* Father and mother alive and well. Mother has had two miscarriages. Father, dissolute.

*P. H.* Age of 6 months was dropped. At age of 10 months developed abscess of the right hip, resulting in ankylosis of hip joint.

*P. I.* Very weak. Cough and expectoration. Discharging ear. Inflammation of the eyes. Poor appetite.

*P. E.* Has marked Hutchinsonian teeth, as have one brother and one sister. P. D., emaciated, very pale. Marked glandular enlargement.

*Lungs.* Marked dulness. Râles and poor respiration.

*Weight.* 46½ pounds, stripped.

June 12, 1913. For a year and a half has had careful anti-tuberculosis treatment. In that time he has gained 11 pounds. Physical signs have improved decidedly. Mixed treatment started on this date.

December 19, 1914. This last year and a half the patient has gained 15 pounds. The improvement has been very marked. Much less lung involvement.

*Sputum.* Repeated examinations of sputum have failed to find tubercle bacilli.

CASE 10. C. B., little girl, 11 years old. February, 1913.

*F. H.* Mother a drinking woman who was deserted by a drinking husband. Adopted at age of 6 months.

*P. H.* Constantly ill. Frequent colds. Digestive upsets. Never able to go to school. Eczema of nostrils, corners of mouth and back of ears.

*P. I.* Referred to me after one and one-half years of treatment for tuberculosis in a public institution.

*P. E.* Showed extensive involvement of the lungs and a poorly developed and emaciated child. A careful record of temperature showed daily temperatures of from 100 to 101.5 for a period of four months. Weight, 65½ pounds.

January 8, 1914. After 11 months' rigid anti-tuberculosis treatment. This child was still very weak, showed marked trouble of the lungs and weighed only 65¼ pounds. Mixed treatment started on this date.

January 7, 1916. Marked and rapid improvement during entire year. In October the child was able to go to school for the first time in her life and has missed only two days of school.

*Lungs.* Showed marked improvement.

*Weight.* 78½ pounds, a gain of 13¼ pounds.

*Sputum.* Repeated examinations of sputum have failed to find tubercle bacilli.

CASE 11. G. P., small boy, 9 years old. December 9, 1909.

*F. H.* One uncle and one brother epilepsy.

*P. E.* Marked Hutchinsonian teeth. Marked lung involvement.

June 19, 1913. After three and one-half years' treatment, this boy gained 20 pounds. Condition of lungs has shown no improvement during the past year. Mixed treatment started on this date.

October 4, 1915. Two and one-third years later this boy has gained 24½ pounds. The improvement of the lungs has been as marked as his improvement in general condition. No tubercle bacilli have ever been found in his sputum.

No Wassermann tests or x-ray examinations have ever been made on these last three cases.

#### DISCUSSION OF FINDINGS.

There is strong evidence of syphilis in these individuals; previous history of sickly children, born into families where there has been a series of miscarriages, dead-born children and early infant deaths; subsequent history of chancre, or loss at early age of their own children; physical signs of general glandular enlargement, Hutchinsonian or badly decayed teeth, sears and skin eruptions; positive Wassermann tests; radiographic findings very positive in three cases, suggestive in three others of syphilitic bone lesion and circulatory lesions. There is equally strong evidence of disease of the lung; marked dulness throughout both chests; poor respiration, limited excursion; varying numbers of moist and dry râles confined more to the bases than the apices of the lungs; history of cough and expectoration. The following evidences of disease were found by the radiograph: periostitis of the tibiae, fibulae, clavicles and ribs; marked broadening of the arch of the aorta; enlarged heart; infiltration of the lung tissue; pleuritic thickening. Definite involvement of bones, aorta and lungs was found in three cases; suggestive involvement of the bones was found in three others, one of the latter showing an enlarged heart and broadened aorta, another an enlarged heart and another pleuritic thickening.

These cases have been under treatment about one year. They have observed simple hygienic rules such as early hours, good food, three meals



a day, re-enforced by two luncheons. In addition they have had Tr. nux and gentian before meals and mixed treatment after meals. One had injections of mercury for five months. All but one has worked steadily. The results of treatment have been small gains in weight, 3 to 16 pounds, great improvement in general physical condition, marked diminution of tendency to take cold, and improvement in chest findings such as disappearance of râles, deeper and steadier respiration and diminishing of dulness. In the one case in which tubercle bacilli were found, no tubercle bacilli could be found subsequent to six weeks of mixed treatment. When this individual stopped mixed treatment, he gradually lost ground, which was regained at once upon the resumption of mixed treatment. Of the three children, one gained in the first  $1\frac{1}{2}$  years of treatment 11 pounds, then the only change in treatment was the addition of mercury and potassium iodide. In the next  $1\frac{1}{2}$  years he gained 15 pounds and the lungs showed a corresponding improvement. Another lost, after one year of treatment,  $\frac{1}{4}$  pound, then mercury and potassium iodide were started. At the end of nine months she had improved so much that she was able to go to school for the first time in her life, and when the year was completed she had gained 13 pounds in weight. The third was under treatment for three and a half years before mercury was given. During that period he gained slowly, the lung condition cleared up very slowly and his weight increased only 20 pounds. After the mercury was started, in  $1\frac{1}{4}$  years' less time he gained  $4\frac{1}{2}$  pounds more, or  $24\frac{1}{2}$  pounds. His lungs, which had shown no improvement for a year, showed marked diminution in dulness, marked increase in respiratory excursion and all râles disappeared. In addition to these marked gains in weight, these children have grown from three to five inches taller since the mercury was started.

#### EVIDENCE, IF ANY, OF SYPHILIS OF THE LUNGS.

We must first establish the fact that there has been disease of the lung in these cases. This is proved by the respiratory symptoms, such as cough and expectoration, tendency towards frequent colds, poorly developed chests, poor expansion, marked dulness and râles varying from few to some and from dry to moist. The radiographs show infiltration in two of the lungs and pleuritic thickening in another. These conditions occurred in individuals where the only signs pointing toward tuberculosis were the physical findings of the chest examination. Family exposure to tuberculosis is lacking, no tubercle bacilli were found in the sputum and von Pirquet tests were negative. On the other hand there is good evidence to point to syphilis in other parts of the bodies, at least of these people. The family and personal history conforms to that diagnosis, the physical examination is in favor of it, the Wassermann test is positive in

contrast to a negative von Pirquet. In three cases the long bones show definite syphilitic lesions and in three others suggestive lesions.

Finally, the evidence of treatment favors the diagnosis of syphilis. These patients were allowed to work, they did not attempt to live or sleep out of doors, but were given instead tonic treatment together with anti-syphilitic treatment. That they made definite improvement is very certain, that they retrograded when they stopped treatment is equally certain. In the cases of the three children, the improvement in condition, after long and most careful anti-tuberculosis treatment, was most marked, and can scarcely be called a coincidence or one that was bound to follow because the tuberculosis was being cured. This improvement was much the longest delayed in that case from which the mercurial treatment was withheld the longest. This improvement under mixed treatment has not taken place solely in the general condition. The local condition of the lungs has improved. Shortness of breath has diminished, asthmatic attacks have disappeared, tendency to take cold has ceased, respiration has become deeper, clearer, râles have dried up and finally the amount of dulness has lessened.

#### CONCLUSIONS.

We have, therefore, cases showing definite lung lesions in persons who lack two definite laboratory signs of tuberculosis, positive sputum and von Pirquet tests, and who give no history of contact with tuberculosis. These persons, on the other hand, react positively to the Wassermann test, have definite family history of syphilis, show syphilitic lesions elsewhere in the body, and respond rapidly to syphilitic treatment. Most important, the local condition of the lungs improves as definitely under syphilitic treatment as does the general condition.

To me, however, the evidence which I have tried to secure is far from conclusive. Too often tubercle bacilli cannot be demonstrated in the sputum of patients who have later been proved to have tuberculosis. The number of cases which I could collect have been too few, the difficulties of controlling them too great; and the lack of radiographic confirmation of demonstrable lesions in the lungs, themselves, leaves us with result of treatment as the strongest link in our chain. This is far too weak a link to overthrow the strong evidence of the pathologist that syphilis of the lungs is very rare.

I realize fully that if there is such a thing as syphilis of the lungs it must be demonstrated on the autopsy table. Of, however, the facts of medical treatment and clinical observation continue to point toward such an infection of the lungs, as I believe they will, greater efforts must be made to find pathological corroboration.



## CONTROL OF SCARLET FEVER.

BY D. M. LEWIS, M.D., NEW HAVEN, CONN.,

*Epidemiologist, Board of Health.*

FROM lack of epidemiological observations on sporadic or endemic cases, the control of this disease is as yet limited to the search for missed cases and the supervision of reported ones. I wish to show that it is possible to demonstrate the carriers of this disease, who, as responsible for the missed as well as the reported cases, are, consequently, the basis for the control of scarlet fever.

The following two cases are illustrative of the type of carriers which are now being recognized rather generally as those who give rise to recurrent cases.

CASE 1. Females, ages 2 and 3, sisters, were reported March 11, 1914. A third sister, age 14, was on that date sent from the house. The reported cases were ready for release and fumigation at the expiration of four weeks. The child aged 2 showed at this time an unfaded tongue, the so-called strawberry tongue, and an edematous, hyperemic throat as contrasted with the sister age 3, whose mucous membranes were quite normal. Though warned as to the danger of further contact with the first mentioned child, the family paid attention only to the fumigation of the entire house that the sister of 14 might be immediately returned to the home. One week later this sister in turn was a reported case. The younger sisters at this time showed the same signs as on their release one week previous. At the time of release of the last reported case, the mucous membranes of all three were normal. During and following this period there were no further neighborhood cases.

CASE 2. A male, age 14, was reported March 9, 1914. Released without inspection at the expiration of one month, the entire house was fumigated for safety for expected company. Within a week the visitor and a friend were both reported cases. The first case at this time showed the characteristic tongue, a markedly edematous throat and an acute rhinitis. With his isolation for some three weeks until the membranes were normal, there were no further cases until November of the same year when a chum of this case was reported with the disease. Again looked up, this boy was found to be again showing a very typical strawberry tongue and a subacute naso-pharyngitis. With his isolation for some two weeks when his membranes had become normal, there were no further cases in the neighborhood for the season.

The following case is similar to the preceding though given as illustrative of how the disease may start up in the fall.

CASE 3. Male, age 5, was reported November 2, 1914. Released at expiration of six weeks with discharging ears and purulent nasal discharge. During following two months there were four neighborhood cases in children of the same age. On August 2, 1915, while seeking diphtheria carriers among some nursery children at their shore cottage, I saw a

boy being admitted who had an ear filled with cotton, a purulent nasal discharge, a marked streptococcus sore throat, a strawberry tongue and a temperature of 102. I asked the matron of the institution to isolate this child until they could learn his home address as he was undoubtedly a case of scarlet fever. The following day I was informed that he was the child described as a case of November, 1914. Without ensuing rash or desquamation, it was only after six weeks' treatment that the nasal discharge was cured and the tongue faded. Through the entire season there has been no case of scarlet fever in this boy's neighborhood, nor has he again stirred up the naso-pharyngeal recurrence of the summer.

The following cases represent types of carriers not yet recognized either by health authorities or by physicians.

CASE 4. Three children, ages 7, 9, and 10, had scarlet fever in March, 1915. As absentees from school in mid November of that year, they were looked up and the following conditions were found. The youngest had had nasal hemorrhages and a purulent nasal discharge for the past four weeks. The other two had had sore throats. All three had characteristic strawberry tongues and inflamed pharynges. All had been treated for malaria and confined to the premises with one exception. The youngest child had played with a new arrival in the neighborhood on one occasion when he had been left alone. A week later this new arrival was a reported case of scarlet fever. This fact was learned at the time of release of the reported case. At the time of beginning quarantine, the mother had been certain that there had been no contact with any neighborhood children, even to her child never having been out of the yard. Later from a neighbor she had learned the fact mentioned.

CASE 5. A female, age 10, had had scarlet fever 4 years previously. A brother age 6, as a school absentee, on examination, showed a throat and tongue suspicious of a recent mild scarlet fever. Onset had been attended by vomiting and fever. The sister mentioned also showed the strawberry tongue and a subacute throat. An older sister who also had had scarlet fever four years previously, showed no signs. The present history was that first the girl, then the boy had been sick with malaria. My records showed that at this time I had two cases referable as to age, sex and school, with these two children, and reported some two weeks after their onset of "malaria." Both boys were in a neighboring school; both girls in a remote one. Both sets were playmates.

CASE 6. Male, age 7, had scarlet fever two years previously. Seen in November, 1915, as a school absentee, he presented, according to his physician, all the signs of scarlet fever except the rash. The onset was with vomiting and high temperature. Had he not attended the boy previously for scarlet fever, the physician stated that he would have at this time reported him as a case. Only after three weeks' isolation did the mucous membrane become normal.

CASE 7. A female, age 12, had had scarlet fever school absentee, this girl showed a recurrent otitis



media and a recent sore throat. The tongue was a fairly typical strawberry type. Out of school but not house confined, this case accounted for two cases of girl chums reported March 16, and an older brother reported on March 20. The records showed that she probably accounted for some six neighborhood cases in girls, two of whom were in another family in the house, during the preceding year at a time that we now learned that she had had a similar disturbance.

CASE 8. A female, age 20, was sent to the isolation hospital as a case of diphtheria. A culture sent me by the physician showed a pure streptococcus. The hospital stated that they would entertain my diagnosis of scarlet fever from the very characteristic tongue and throat. At the end of one week, failing to find any eruption or desquamation, and finding that the patient had had the disease 10 years previously, on her request she was discharged. Attempting to obtain the history of any infective periods during the ten year period, I found that a sore throat of the previous year corresponding to a period when scarlet fever was beginning to appear in a corset factory only to shift to a munition factory. The three cases in the first factory were in girls, those in the latter were among men. Some few days after her sore throat had commenced, this girl had left the corset factory and began work in the munition factory. A week later began a long series of cases among men in two different machine shops and a few of the central office force. At that time, I had found that the only common communication was through a force of girls who handed out and received back machine tools for these men from behind a counter. The central office force also had contact with these girls. Numbering upwards of 100, I had asked the factory sanitarian to examine this set of girls for strawberry tongues and red throats. The following day he reported that he had found none. I now had the data that she had been one of this set of girls. Further past history was refused when I pointedly asked as to the disease having been present in houses where she had lived, although a friend who was present remarked on the fact that once when she had had one of her sore throats, a girl in the house had later had scarlet fever. This case represents the longest time interval after having had the disease of showing the signs of a carrier that I have yet seen. The buccal-pharyngeal signs even after the now ten days' illness were the most marked that I have yet seen. The basis for this was apparently an extraordinary lymphoid hypertrophy of the naso-pharynx.

*Proving of carriers.* That those individuals who have at the end of convalescence ear or gland discharges, may be carriers needs at the present time no proof. That those who have had the disease previously may be carriers can be proven under the same conditions as the former. The one essential is that both groups shall show some grade of buccal-pharyngeal inflammation as shall be characteristic of primary scarlet fever. With the subsidence of this factor in the first group and its absence in the second group, I do not find individuals infective. That both groups are infective during its presence, is demonstrable by the recurrent cases in the family if the first group is then in contact with suscep-

tibles, and by the absence of further cases in the family or friends when the second group is isolated. With the finding of carriers of the second group when they are confined to bed, I have found that a single exposed individual in the family may develop the disease. Otherwise, and especially where there are no other children in the family, I have found that I have had neighborhoods where such individuals have been found in the early fall, isolated for the three and even longer weeks of the tongue and throat inflammation, and the entire season passed with no cases of the disease appearing. Again, where these individuals have been found after there has been one or more cases of generally, the same sex, age and factor of being playmates, there will be no further cases when that individual is isolated. In one instance where the individual could not be controlled there was a later case. A further factor of proof is that in doing neighborhood survey work, I have seen these carriers, previously showing positive signs and apparently accounting for reported cases, later have sore throats without positive signs, be permitted their freedom of contact and not have cases of scarlet fever follow.

*Results.* During the first four months of epidemiological work, the usual régime of quarantine and terminal fumigation then holding, I had 4 recurrent cases in a total of 198 cases. During the following two years with approximately 500 cases, I had but 1 recurrent case. That was an instance where from necessity the quarantine had to be removed and only the convalescent carrier isolated. Unknown to me, one of the children of the family who had been a hospital resident for four months was then returned to the home and in one week was a reported case. During the first year of simple isolation of the one sick with inspection to prevent convalescent carriers, doing away with fumigation, I prevented secondary as well as return cases. This in spite of the fact that less than 10% of the cases were hospitalized. During the second year with the added factor of finding of the carriers who had previously had the disease, I have had a lessened number of reported cases. Of yet greater importance is the result from the simplified procedure of quarantine based on my results in diphtheria, which disease has been made infrequent in incidence compared to all previous years and with reference to other cities of this state for this year. Based on the frequency with which I could demonstrate carriers who had had the disease either in the family, in other families in the house or neighborhood, the procedure is as follows: Immediately after inspection at the time of quarantine, all school children in the same house, but outside the family, are returned to school from that residence. All children in the family concerned are returned if they will live and board with another family in the house or neighborhood. Any carrier in the family, house or neighborhood, was isolated, though given rear yard freedom during school



hours, if under supervision, and there were no children to gain access to the yard. All adults were allowed to live at home irrespective of occupation. Inspection of adults was insisted on only when there was a history of previous sore throats or the adult was a raw food handler. Of upwards of one thousand children and one half that number of adults returned to school and work respectively, at the time of instituting quarantine, I have had but two instances of secondary cases in the family, house or neighborhood when the carrier was found. One was in a child who contracted the disease three weeks after she was returned to school from a remote neighborhood, the other was an adult who contracted it from his wife who in turn contracted it from taking charge of a case of the disease in the family. Otherwise, none of these individuals given their usual previous freedom of living have developed the disease. I have then the proof that the secondary cases so frequent previously were not due to being exposed by the one sick but by the carrier. In diphtheria, as well as scarlatina, it has been my experience that no matter how poor the isolation of the patient ill, irrespective of the ages of the other children in the family, none will get within reach of the one ill, all will flock on the other hand to the carrier. The latter's popularity may always be estimated by the number of cases he causes.

*Finding of carriers.* As described in my article on the Control of Diphtheria, postal card notification of all school absentees, as well as those who are in school and have nasal or ear discharge, is the basis for finding carriers. A Visible Index of all previous cases with their addresses is also made use of when no carrier can be found in the house of a reported case.

*Frequency of carriers.* During the last four months of 1915, with some 39 reported cases of the disease, I have a record of 21 carriers found as well as 3 missed cases. During the first five months of 1916, with some 90 cases of the disease, I have a record of 10 carriers and 2 missed cases.

#### CONCLUSIONS.

I have practically abolished recurrent cases, made infrequent secondary cases, and lessened reported cases, by demonstration of the carriers of convalescence and the carriers previously having had the disease and by isolating these carriers.

Results of the so-called grading of quarantine does not depend on the quarantine, but upon the fact as to the presence of the carrier being within or without the family circle.

Full liberty may be safely given to all contacts who are free from the signs of the disease at the time of isolation of the one sick and the carrier.

Control of scarlet fever will be found to lie in the supervision of those who have previously had the disease, at and during those periods when with intercurrent infections they again

show the buccal-pharyngeal signs of scarlet fever. Secondly, missed cases and the convalescent reported cases are of equal importance.

### Society Report.

#### BOSTON SURGICAL SOCIETY. (Incorporated.)

##### TWELFTH MEETING.

A clinical meeting of the Society was held on Monday, April 3, 1916, at the Children's Hospital, at 10 A.M.

Cases were demonstrated by members of the staff of the Children's Hospital as follows:

I. Tuberculosis of the Metaphysis with Subsequent Extension Into the Epiphysis of the Femur. DR. LOVETT.

II. Apparatus devised as a combination of the Bradford frame and plaster, for the fixation and suspension of a child with fracture of the spine. DR. LOVETT.

III. A case recently operated upon for paralysis of the gluteus medius following poliomyelitis with a bad limp. The tendon of the vastus externus had been sutured with sixteen strands of No. 10 silk, four inches long, to the crest of the ilium. DR. LOVETT.

IV. A case for operation showing the application of a tag to the child's neck, in the ward, corresponding to the operation tag, so there would be no mistake in the operation on the side affected. This was a case of a child of nine years who had infantile paralysis at three years, with anterior tibial paralysis. A demonstration was made of the method of measuring the strength of the muscle pull of the affected muscle, and the peroneus longus was sutured in place of the paralyzed anterior tibial. DR. LOVETT.

V. A very severe case of infantile paralysis in a child with extraordinary deformity from contracture, showing the method of gradual straightening by plaster with wedges and tension straps.

VI. A demonstration of the relative methods of treating by traction and by abduction in fractures of the neck of the femur; illustrated by two cases—one of osteomyelitis, and one of congenital coxa vara. (In this case the mother also had a congenital coxa vara.) DR. LOVETT.

VII. DR. HARMER gave a talk on the treatment of naevus with liquid air and oxygen. He stated that it was not an effective treatment for the cavernous type, and showed two cases of excision of cavernous angioma of the neck.

VIII. DR. HARMER also gave a report on the study of ten cases of spina bifida which had entered the hospital since January 1st; average age, three days. All had meningoceles; all showed paralysis. One case showed a tumor the size of 5 cm. on the buttock, with prolapse of rectum and incontinence.

IX. DR. HARMER also showed a patient cut upon the wrist by a milk bottle. All flexor tendons divided with the exception of the thumb and the median nerve. Remarkably good result at five and



a half months after suture. No splint was used in this case, and motion was begun at once.

X. DR. LADD then demonstrated a case of hare-lip with wide separation of the intermaxillary bone. Age 10 months; operation 10 days before. Dr. Ladd demonstrated a clamp which he uses for guiding the cut in the lip margin, in order that both sides may be symmetrical.

XI. DR. STONE showed a case of Volkmann's contracture following fracture of the clavicle and bandaging of the arm, with sloughing and contracture. Dr. Stone detached the muscles from the internal condyle in order to permit lengthening, and had also done one abdominal plastic flap for contracture of the hand.

XII. DR. C. J. MIXTER showed a case of sarcoma of the bladder, operated upon by sub-peritoneal cystectomy, with closure of the fistula in about one month.

XIII. DR. MIXTER also demonstrated a patient with tuberculous peritonitis treated by injection of nitrogen.

XIV. Another case of tuberculous peritonitis was demonstrated in which the first laparotomy was followed by a re-accumulation of fluid, but the second operation with the use of nitrogen was followed by a satisfactory result.

XV. DR. MIXTER also showed a case for decapsulation for chronic nephritis.

XVI. DR. STONE showed a patient with gangrene of the serotum resulting from infection of the umbilical cord in an infant, and spoke of other cases with extension to the peritoneum and the subcutaneous tissues of the thigh.

XVII. DR. LADD showed a case of imperforate anus in a child 24 hours old.

XVIII. DR. LOVETT showed a case of imperforate anus with recto-urethral fistula.

XIX. DR. LOVETT also showed a case of post-diphtheritic paralysis of obscure onset.

XX. DR. C. J. MIXTER then operated for tuberculous peritonitis by injection of nitrogen.

The meeting then adjourned.

(Signed)

ROBERT B. GREENOUGH,  
*Secretary.*

## Massachusetts Medical Society.

### DISCUSSION OF SYMPOSIUM ON GOITRE.\*

DR. M. C. SMITH, Lynn: I wish to make a few remarks on this subject from the standpoint of the dentist. Hypothyroidism is today being recognized as a dental disease, and should be treated by the dentist. I do not think that there is any one symptom of insufficient thyroid secretion that is so thoroughly manifest as the condition in the mouth. The number of children that come to the dental clinics and to the office with irregular dentition, and with delayed and erratic dentition, and decayed teeth due to faulty metabolism of the thyroid, is becoming appalling, and something should be done to try to correct it before the teeth are erupted.

From the time of birth until the child is seven or eight we can tell almost the exact time when the child suffered most from the lack of thyroid secretion, and the fixation of lime salts in the teeth, and if the child suffered from lack of mineral salts in the teeth, it is reasonable to infer that the other bones also suffered.

In some children the benefit gained from the administration of thyroid is most marked, especially in cases of delayed dentition and in children bordering on cretinism. It has been my practice for some years to give thyroid to all children suffering with adenoids, enlarged tonsils, and to all cases of orthodontia. I never think of beginning to regulate the teeth of a young child without first giving thyroid, and I think the results justify the treatment.

DR. THEODORE C. JANEWAY, Baltimore: I want to express my very great interest in the various papers of the afternoon. I sat here quite fascinated by all that I have heard, and I want to congratulate the Society on such an admirable symposium.

There is one point which seems to me is reinforced by some results of the investigations which we have heard of this afternoon, and which we can all take to heart, even though we cannot ourselves apply the method of calorimetry. That is the very great significance of loss of weight as a symptom of hyperthyroidism. To any one who will pay attention to it, the effect upon the metabolism, which plays so important a part in the picture of the disease, can be detected early. I am quite sure that many patients are passed over merely because of the failure to recognize the significance of a continuing loss of weight, in spite of preserved appetite, and apparently for a time preserved energy and bodily activity. I have seen that symptom, when recognized, permit of successful medical treatment, in spite of the fact that I agree that, for the patients studied nowadays in hospitals, surgery is usually necessary. One of the reasons for the difference of opinion between surgeons and medical men is that we tend more and more to treat our patients in hospitals. We think in terms of the hospital population.

In hospital patients with exophthalmic goitre, as with most hospital patients with gastric ulcer, operation is a short cut to a cure. It is most desirable where the time consumed by protracted medical treatment of any kind is unlikely to be afforded. The patients will usually break off medical treatment before a sufficient period has elapsed. It is often the case that two years is necessary for the successful medical treatment of exophthalmic goitre. In private patients who can and will cooperate, however, the medical man may accomplish cures, and cures which are permanent, however, and Dr. Cannon's work is bringing more hope in that regard. Such patients must be carefully selected and still more carefully managed.

We must go back to the thyroid gland for the

\*Continued from the issue of the JOURNAL for October 1909 (Vol. clxxv, page 569).



explanation. All the surgeon does—and of course it is a most important thing—is to break the vicious circle at its weakest point by the removal of the over-secreting gland, which is continually increasing the disturbance by its particular contribution.

One other point has interested me very much, and that is Dr. Boothby's statement about cases of myxedema. I have been very much impressed, in seeing mild cases of myxedema in consultation, with the frequency with which they are mistaken for chronic nephritis. Three things account for this,—the regular presence of albuminuria and hyaline casts, with low specific gravity of the urine, the edema of the lower extremities and the change in the color of the skin; also, in many cases, the occurrence of headache as a symptom, and the frequent moderate hypertension. I am not sure that I agree with Dr. Boothby that we may look on hypothyroidism as the cause of chronic nephritis, but I think, rather, that the diagnosis is wholly erroneous in some cases of chronic nephritis, and that the patient really has myxedema.

#### REPORT OF COMMITTEE ON WORKMAN'S COMPENSATION.

THE conditions under which the medical provisions of the Workman's Compensation Act have been operating in many of the industrial centres, have been more and more regarded by the physicians of the State as unsatisfactory. A belief that the injured employee was not getting in many places such medical services as were his due, has interested the profession sufficiently to create a strong demand that the State Homeopathic Society and the Massachusetts Medical Society investigate the matter and attempt to modify such conditions as seemed unfair. These investigations and the changes indicated by the results of the investigation will be under the direction of a Central Consolidated Committee. The nucleus of this committee is the Workman's Compensation Committee of the Massachusetts Medical Society, to which has been added a representative from each district society and, by invitation, three members of the Massachusetts Homeopathic Society (hereafter mentioned as the Workman's Compensation Committee.)

The events leading up to the formation of this committee and its personnel will be found in the issues of the JOURNAL for Sept. 28 and Oct. 19. There has also been considerable discussion of the subject in other issues of the JOURNAL, which, as the official organ of the Massachusetts Medical Society, places its columns at the disposal of all who desire to discuss important professional subjects.

The Workman's Compensation Act Committee has divided itself into sub-committees. The

chairman of the Workman's Compensation Committee, and also of the sub-committee on legislation and finance, is Dr. A. N. Broughton of Jamaica Plain (Boston), and its secretary, Dr. J. A. Mehan, Lowell. Sub-committees on the following matters have been appointed. Legislation, Dr. Broughton, chairman; Finance, Dr. Broughton, chairman; Information and Statistics, Dr. Snow of Newburyport, chairman; Publicity, Dr. Mehan of Lowell, chairman. These appointments and addresses are given in detail because the members desire to receive all kinds of information and criticism which their fellow workers think useful to the cause, or to them personally. In many of the districts there are district committees organized to cooperate with the central committee, and it is desirable that each district society appoint such committees, and also each city medical club.

The Compensation Committee has held two meetings, and its sub-committees two. There is an agreement that much of the unsatisfactory working of the medical provisions of the law is due to the injured employee being obliged to accept the services of a physician employed by a commercial company, or forego the medical benefits of the act. That this has been regarded by the workers as detrimental to their best interests is evidenced by their organizations introducing and supporting in the legislature each year bills calling for an amendment of the act to give them freedom to employ the physicians in whom they have confidence. The workman is the important factor, and the careful attention which will make him as comfortable as possible and return him to work at the earliest possible day is, of course, his desire, and the desire of the medical profession. The knowledge that the physicians hired to care for him usually do so at a less rate than such services demand in the open market, does not increase his confidence in their efficiency. In this belief the physicians of the State (including the members of this committee) and the wage-earners are in complete accord.

The committee on statistics wishes all the information any of the readers of the JOURNAL can give on any of the phases of the working of this act and also upon any other subject affecting the practice of medicine.

With the letter from the chairman of this committee telling each physician in the State of this work, will be enclosed a blank asking in detail for the information the committee thinks most important at this time. It is hoped all physicians will give this matter of information the consideration it deserves. It is important now and may be increasingly so in future years. The success of this movement is so largely dependent upon the work of each physician in his own locality that the committee urge all to persistent action who believe, with the great majority of the profession, in these amendments.



## Book Reviews.

*A Practical Treatise on Infant Feeding and Allied Topics for Physicians and Students.* By HARRY LOWENBURG, A.M., M.D., Assistant Professor of Pediatrics, Medico-Chirurgical College of Philadelphia. Illustrated with 64 Text Engravings and 30 Original Full-page Plates, 11 of which are in colors. Philadelphia: F. A. Davis Company. 1916.

The author, in this work upon infant feeding and allied topics, comes out very strongly in favor of breast-feeding. He shows that far more babies can be fed on the breast than now are, and that the unnecessary cessation of breast-feeding is the cause of many disturbances of digestion and not a few deaths. His directions for the modification of the breast milk are, however, hardly in accord with our present knowledge of the subject. His general discussion of "percentage" and "calorie" feeding is very satisfactory. In spite of this, however, he makes relatively little use of percentages in his methods of feeding and treatment. He advises the giving of skimmed milk mixtures in the beginning, gradually working to whole milk mixtures. He advocates the use of cane sugar as a routine measure. He shows his familiarity with the ideas of the German school of pediatricians, but in general follows the so-called American ideas. He differs especially from the German school in recognizing that protein, as well as fat and sugar, may cause disturbances of digestion. He emphasizes very strongly the importance of individualization and experience in the artificial feeding of infants, and in this connection advises the use of the term "adaptation" rather than that of modification of milk. He constantly emphasizes the importance of the examination of the stools in regulating the diet both in health and disease, and also recognizes the important part which bacteria play in the etiology of the disturbances of digestion. We regret that he recommends several of the proprietary foods in the treatment of diseased conditions in babies. We believe that it is unnecessary to use these foods, and that the same, or better, results can be obtained in other ways.

After discussing Feeding, he gives chapters on Infantile Atrophy, Rickets, Scurvy, Vomiting, Constipation, Diarrhea, Spasmophilia, The Exudative Diathesis and Pyloric Obstruction. It seems to us somewhat improper to treat of vomiting, constipation and diarrhea as if they were diseases, in the same way as rickets and scurvy. It would seem better to treat them as symptoms of the disturbances of digestion. He believes that spasm of the pylorus is the cause of hypertrophy, and states that clinically all cases of obstruction at the pylorus become oper-

ative when sufficient aliment fails to reach the intestines. This seems to us a very reasonable ground to take. The book closes with a chapter on special methods of treatment. There are many pictures, almost all of which are original and very good.

*Painless Childbirth Eutocia and Nitrous Oxid-Oxygen Analgesia.* By CARL HENRY DAVIS, M.D. Chicago: Forbes and Company. 1916.

The first part is a short review of the various attempts to make childbirth painless. In the second, the author gives some very pertinent facts on obstetric mortality and morbidity. The third part is taken up with the technic of the use of nitrous oxid-oxygen analgesia. The author is enthusiastic about nitrous oxid analgesia but his enthusiasm goes beyond bounds when he states "there is no logical reason why women should suffer during labor." The book is welcome because it stands out in such contrast to the unscientific books which have appeared during the past year about "twilight sleep" and painless childbirth. Although the reviewer cannot agree with all the conclusions and feels confident that later the author will at least modify some of them, the book is an excellent monograph on the subject.

*A Guide to Gynecology in General Practice.* By COMYNS BERKELEY, M.A., M.D., M.C. (Cantab.), F.R.C.P. (Lond.), and VICTOR BONNEY, M.S., M.D., B.Sc. (Lond.), F.R.C.S. (Eng.), M.R.C.P. (Lond.) London: Henry Frowde and Hodder and Stoughton. 1915.

Under the modest title of a Guide to Gynecology in General Practice, Berkeley and Bonney present an excellent book. It is written for the practitioner, but undergraduate students will find it valuable in their clinical training. Its purpose is to supplement textbook and lecture and it contains no details of operative technic. It attacks the problems from the point of view of the practitioner and is therefore likely to prove very useful.

The subject-matter is considered under five heads: Examinational Methods, Significance of Symptoms, Interpretation of Physical Signs and Methods of Treatment; finally, the Medical-legal Aspect of Gynecology is discussed. The fifth part is a welcome addition, though the difference between the law in England and in this country makes this section of less value to American physicians, and the example of the authors is one that deserves commendation.

The book is to be recommended highly for clearness of presentation, breadth of view and soundness of judgment. The illustrations are numerous and excellent. It is a pleasure to see such an adequate presentation of the subject.



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## THE PROPAGANDA OF ANTI-VACCINATION.

THE attention of members of the Massachusetts Medical Society, and of all other physicians, is called to the letter from Dr. Woodward, President of the Society, published in the correspondence column of this issue of the JOURNAL. The annual recurrence of anti-vaccination propaganda does not arouse, as it should, the active opposition of the medical profession. Each year the margin by which anti-vaccination legislation is defeated seems to be diminishing. Ultimate passage of such legislation, however, could be due only to the apathy of physicians and to their failure to present to the public and to legislators, collectively and individually, the truth about vaccination and the fallacy of the anti-vaccination movement. Committees on medical legislation can accomplish little unless their action is supported by

the firm and unanimous voice of the profession which they represent. During the coming season many legislative matters of medical importance, in addition to that of anti-vaccination, will be under discussion and will require the intelligent study of members of the profession, if they are to be decided with best regard to the public welfare. As in the past, it will be the effort of the JOURNAL to assist physicians in this way by presenting the facts on both sides of every question, with such discussion as may be helpful to its readers in the formation of individual opinion. Only by the concerted and active coöperation of all, however, can there be developed a genuine medical public opinion which shall be of value and power in the direction of medical legislation for the common good.

## THE WORK OF DISTRICT MEDICAL SOCIETIES.

AT this time of year the chairmen and secretaries of various district medical societies, and others, are busily engaged in preparing their yearly programs of subjects to be discussed. This is an important piece of work, and we believe it does not always receive the mature and careful consideration which it deserves. The choice of subjects is far too apt to be left to the individual preference of the chairman or secretary, resulting in an ill-balanced list of papers and important omissions.

Medical societies have two very definite functions: (1) to promote social intercourse among the members, and (2) of more importance, to disseminate knowledge and to present facts and give information on important and vital subjects which the general practitioner can get in no other way. Individual preferences of this or that group of physicians ought not to be too seriously considered at these meetings. It is very likely that any group of busy general practitioners, tired out after a hard day's work, would be vastly more interested in a thrilling account of life in the trenches and war surgery than in a discussion of the importance of preventing the ravages of syphilis or the early diagnosis of tuberculosis. It is manifest, however, that the two latter subjects are of infinitely greater importance than the former.



This is strikingly illustrated in the programs of a certain large medical society in this state, which neither in its program for the coming year nor in its programs for the past three years, has included the subject of tuberculosis for the reason frankly given, that tuberculosis would not draw a crowd and that the doctors are not interested in it. To many this would not appear a sufficient reason for such an important omission. In the programs of 14 district medical societies in this state for the year 1915 there were 97 subjects discussed. Of these, 67 were what might be called distinctly clinical subjects, while 30 were non-clinical and dealt with topics relating to the broader aspects of medicine. Of this last group, 16 out of the 30 were papers relating to the present war, leaving 14 papers out of a total of 97 which took up the subjects of public health and preventive medicine. In view of the present tendencies of modern medicine this hardly seems a just proportion. We believe that more attention should be given to such subjects as medical education of physicians in the early diagnosis of cancer, tuberculosis and similar diseases, the improvement of our medical schools, the administrative control of the venereal problem, health insurance, etc., and we also believe that the majority of general practitioners in this State will agree with this point of view.

### THE NAVY AS A FIELD FOR MEDICAL WORK.

THE attention of graduates in medicine under thirty-two years of age should be earnestly called to the opportunities offered by the Medical Corps of the United States Navy as a special field for professional work. Legislation has recently been enacted which will provide for approximately three hundred additional medical officers in this corps, giving immediate opportunity for work and advancement to those properly qualified.

The naval medical officer should be regarded as a specialist, concerned, it is true, with many departments of medicine, but approaching them all from a unique standpoint. His patients belong to a selected group and, under conditions of service in peace or war, offer particular clinical problems. Moreover, as such a group, the material afforded gives especial opportunity for work in preventive medicine and for dis-

coveries in scientific branches of great value in the advancement of medical knowledge. The Navy, like the Army, constitutes a group of material under definite conditions of discipline which make possible research on a scale that cannot often be attempted under the uncontrolled conditions of civil life. Hence it is, that the appeal of the naval medical service is not solely to the instincts of a practitioner or to the love of adventure, but to those of the research student in medicine as well, whose aptitudes lie in the field of scientific medicine.

These considerations represent merely the field of opportunity to the individual; but there should not be forgotten also the opportunity of service which the naval medical officer enjoys in the diffusion of ideas in hygiene and allied medical branches, not only in his own country, but throughout the world.

The United States Navy has recently issued a circular for the information of persons desiring to enter its medical corps and another circular listing the physical qualifications required. Examinations for these positions are to be held in several of the coast cities of the United States, both East and West, and also in Chicago. Full particulars regarding the time and places of these preliminary examinations, with descriptive literature and the circulars mentioned above, may be obtained by addressing Dr. W. C. Braisted, Surgeon-General, United States Navy Department, Washington, D. C.

### THE CUTTER LECTURES.

IN another column of this issue of the JOURNAL we publish a brief account of the life and work of Dr. John Clarence Cutter, founder of the Cutter lectureship on preventive medicine at the Harvard Medical School. The first quin-quennium of this valuable institution has already been completed and the lectures thus far given, by men of distinction in the medical profession, have proved genuine contributions to the knowledge and exposition of the science of preventive medicine. In this connection, therefore, it is of interest to publish also the following list of Cutter lecturers with the dates and titles of their papers.

1. Dr. Wm. H. Park, March 13, 1912. Observations on Dosage and Methods of Injecting Anthrax in the Treatment and Prevention of Diphtheria and Tetanus.
2. Dr. John F. Anderson, May 9, 1912. Some Re-



- cent Advances in Our Knowledge of Certain Infectious Diseases.
3. Dr. George C. Whipple, March 31, April 2, April 7, 1913. The Use of Vital Statistics with Truth, with Imagination, with Power.
  4. Dr. Mark W. Richardson, May 12, 1913, and May 14, 1913. Health Administration.
  5. Dr. Charles V. Chapin, March 20, 1914. Science and Sanitation.  
March 27. Efficiency of Public Health Measures.  
April 2. Organization of the Health Department.  
April 9. Research and Publicity.  
April 16. Nuisance Problems.  
April 30. Contagious Disease Problems.
  6. Dr. Cressy L. Wilbur, March 25 and 26, 1914. Vital Statistics in Massachusetts and the U. S.
  7. Dr. Joseph Goldberger, April 2, 1915. Diet and Pellagra.
  8. Dr. Victor C. Vaughan, April 14, 15, and 16, 1915. The Phenomena of Infection.
  9. Dr. George W. McCoy, April 3, 1916. The Public Health Aspects of Leprosy.
  10. Dr. Simon Flexner, April 26, 1916. The Finer Adjustments of the Immunity Reactions to Recovery from Infection.

### PROGRESS OF POLIOMYELITIS.

DURING the past week the Massachusetts epidemic of poliomyelitis has, on the whole, declined, although the daily number of new cases still remains considerable. The total number of cases during the month of October was 703, as compared with 623 in September, 253 in August, and 107 in July. More careful statistical investigation has shown that during the month of August there were 67 deaths from this disease in Massachusetts instead of 39, as had previously been reported. These deaths were distributed among the several cities and towns as follows: Boston twenty; North Adams, ten; Springfield, five; Pittsfield, three; Somerville, three; Easthampton, two; Medford, two, and the following one each: Agawam, Amesbury, Bourne, Brookline, Dudley, East Longmeadow, Fall River, Georgetown, Greenfield, Haverhill, Holyoke, Lawrence, Littleton, Lowell, Lynn, New Bedford, Newburyport, Newton, Northampton, Southwick, Westfield and Worcester. In September there were 151 deaths, of which 57 were in Boston. Accurate data are not yet available for the number of deaths in October. During the first four days of November there were 45 cases.

The following statistics relative to the distribution of epidemic cases throughout the United States have been compiled from a recent weekly bulletin of the United States Public Health Service:

"Massachusetts, 1761; Maine, 104; Vermont, 35; New Hampshire, 53; Connecticut, 812;

Rhode Island, 179; total, 2610. In New York City in the period aforementioned, there have been 9216 cases, of which 2373 were fatal.

"A comprehensive idea of the way the fingers of this disease have been laid upon the entire country may be gathered by figures from the report for widely separated sections.

"Nevada and New Mexico, from July 1 to Sept. 24, have been spared altogether, while Wyoming has seen only four cases from July 1 to Sept. 30; North Dakota, 8, July 1-September 25; and Utah 5, August 1-31—a gentle touch in the Rocky Mountain zone.

"New York State, exclusive of New York City, has a total of 3495. Adjoining the island of Manhattan, New Jersey registers 3917, and Pennsylvania, little separated, has 1561. Then the statistics taper in going South. Delaware, small in area, 57; Maryland, 254; South Carolina, 113; Alabama, 151; Louisiana, 31. Only eight cases were recorded in Florida.

"Illinois, in the Middle West, is relatively high, with 749 cases. Iowa has 198, Indiana 150, and Ohio 400.

"California with 50 cases, Oregon with 14, and Washington with 20, display no very great trouble along the Pacific slope.

"Indiana, Illinois and Ohio have been mentioned. Other Lake States showing some pressure are Michigan, 423, and Minnesota, 784.

"Statistics from all States practically all begin from July 1. They end variously at September 25, October 14 and October 17. In some States the disease is present, but its extent is not recorded. On this basis the country-wide total is 25,266 cases."

At the forty-fourth annual meeting of the American Public Health Association, held last month in Cincinnati, Dr. Thomas F. Harrington, of Boston, deputy commissioner of labor in Massachusetts, presented on October 26 a paper dealing with 42 cases of chemical poisoning from gas and fumes, reported during the past year to the Massachusetts State Board of Labor and Industries. Basing his argument upon a discussion of these cases, Dr. Harrington is reported to have advanced the theory that poliomyelitis is a disease due not to a microorganism, but to a chemical intoxication. In the daily press Dr. Harrington is quoted thus:—

"All observations point to one conclusion only, namely, that they are one and the same disease. Paralysis, neuroses, disturbance of movements, diminution of muscular power, twitching, wasting of muscles, hypersensitiveness, numbness and loss of sensation of the skin, eruptions on the skin, digestive disturbances, sore throat, bronchitis, psychoses, poliomyelitis, sclerosis of the cord, delirium, convulsions, coma and death constitute a group of symptoms com-



mon to both infantile paralysis and gas and fume poisoning.

"Dizziness, unconsciousness, mental confusion, convulsions and death have been reported among chauffeurs and others working on or about automobiles, in the open air as well as in confined spaces. Although cases of infantile paralysis have been recognized in many countries for years, nevertheless its prevalence in an endemic and epidemic form dates from the introduction and wide use of the automobile.

"In other words, in infantile paralysis we are dealing with a chemical agent and not with a microorganism, a condition identical to that met with in poisoning by the fumes of lead, mercury, arsenic and antimony.

"These gases and fumes are heavier than air and travel close to the ground, with a tendency to seek rivers, streams and ponds. This characteristic of these chemicals explains the greater prevalence of infantile paralysis among susceptible children living in lower parts of houses, and also the occurrence of epidemics of this disease among animals and fowl living in the ground stratum of air.

"The most successful treatment for gas and fume poisoning promises the best results in the treatment of infantile paralysis, namely, neutralize the acid condition by saline solutions—locally and intravenously, transfusion of blood, oxygen inhalations, hot baths, rest and warmth; for the later stages, rest, heat, massage, electricity, splints, hygiene.

"The preventive measures successful in combating industrial poisoning from gases and fumes suggest the line of action most promising in reducing the ravages of infantile paralysis, viz.: First, a recognition of the dangers in gases and fumes from motor fuel, especially for automobiles, and second, a close supervision by Government control of the nature of fuel used for motor vehicles, gas engines and for domestic purposes, to the end that the poisonous elements shall be reduced to a minimum in petroleum and coal tar products used for purposes of light, heat or power."

The complete report of Dr. Harrington's paper and the further exposition of his theory will be awaited with interest.

#### MEDICAL NOTES.

**GIFT TO COLUMBIA DENTAL SCHOOL.**—Report from New York states that on October 29 the trustees of Columbia University announced gifts to the sum of \$125,000 for the establishment and maintenance of a dental school and infirmary in conjunction with the University.

**AWARD OF DAMAGES AGAINST A MIDWIFE.**—Report from San Francisco states that on October 24, Justice Murasky of the California Su-

perior Court awarded damages to the amount of \$25,000 against a graduate midwife who, it was alleged, had not exercised proper prophylactic care of a baby's eyes, with the result that it became blind from ophthalmia neonatorum. This verdict is of significance as indicating the opinion of this court, with reference not only to the responsibility of midwives, but to the extent of damages to be awarded for loss of eyesight in a baby.

**CLINICAL CONGRESS OF SURGEONS.**—The seventh annual session of the Clinical Congress of Surgeons of North America was held in Philadelphia during the week of October 23 under the presidency of Dr. Fred Bates Lund of Boston, and in accordance with the program and announcement published in the issue of the JOURNAL for October 5. The usual clinics were held before the several sections of the Society at the various Philadelphia hospitals. In accordance with a vote passed a year ago, adopting a follow-up system in connection with all cases operated before the Congress, a report was presented covering the end-results of the operations performed before the Congress last year in Boston. At the meeting on October 26, a resolution against dichotomy was adopted. It was voted that the next meeting of the Congress shall be held in New York, and Dr. John G. Clark of that city was elected president for the ensuing year. Other officers elected were Dr. George Henderson Dee, Galveston, first vice-president; Dr. Edgar W. Allen, Edmonton, Alberta, Canada, second vice-president; and Dr. Franklin H. Martin of Chicago, secretary general.

The annual meeting and convocation of the American College of Surgeons was also held in Philadelphia on October 27, and adopted a resolution establishing a board of surgical censors to control future admissions to the college. Two hundred and twenty-eight new Fellows were admitted at this session, of whom two were from Maine, four from Connecticut, eight from Rhode Island, and the following nine from Massachusetts: Drs. George D. Bliss, Dorchester; Charles William Bush, Frederick Lafayette Jack, James Krauss, Louisa Paine Tingley and Agnes C. Victor, all of Boston; Gilman Leeds Chase, Clinton; Harry Cleveland Cheney, Palmer; and Ralph W. Jackson, of Fall River. The college now numbers over four thousand Fellows. At the business meeting, Dr. George W. Crile of Cleveland was elected president for the ensuing year, and Chicago was chosen as the permanent headquarters of the organization. It was announced that with the sanction of the United States Government the American College of Surgeons has appointed a commission to make a tour of South America for the purpose of establishing closer relationship between the surgeons of both continents of the Western Hemisphere. The members of this commission are: Drs. Edward Mar-



tin, Philadelphia; A. J. Ochsner and Franklin H. Martin, Chicago; Frank S. Simpson, Pittsburgh, and either C. H. or W. J. Mayo of Rochester, Minn.

#### EUROPEAN WAR NOTES.

**BELGIAN SURGICAL DRESSINGS FUND.**—The Belgian surgical dressings industry has fulfilled so satisfactorily the double purpose for which it was started in March, 1916,—that of giving employment to Belgian women refugees in England, and of increasing the supply of dressings for the army,—that its organizers feel justified in sending out a second appeal, in order to continue the work. Mrs. Erskine Childers, who has undertaken the management of the industry in London, as a branch of her great work for the Belgian refugees there, writes of the appreciation, on the one hand, of the Belgian Red Cross, for the supplies which they receive from the industry, and on the other, of the gratitude of the women for the opportunity given them to do this work, which is naturally most congenial, as by it they are helping their husbands, sons and brothers at the front. The extent of the work is limited only by the amount of funds procured, and Mrs. Childers is eager to increase as well as continue it.

Miss Olive Simes will gladly receive contributions for the Fund, addressed to her at 46 Chestnut Street, Boston.

**MORTALITY FROM WAR AND FROM ALCOHOL.**—Dr. C. W. Saleeby, F.R.C.S., F.R.S., a well-known English physician, has recently issued a statement relative to the comparative mortality due to war and to the use of alcohol by a community. He states that the annual loss of life in Britain amounts to three-fourths of the loss during the first year of the European War.

"The first year of the great war cost us about eighty thousand fine lives of our soldiers and sailors.

"But during every year of peace, alcohol takes at least sixty thousand lives in this country. On the most moderate reckoning it is responsible for one-seventh, or about 14% of the whole death rate. This toll of over a thousand lives a week, year in and year out, is three-fourths of the toll exacted by the greatest war in history.

"Estimating from the average size of a family and the known death rate from alcohol, we find that this destroyer of the people, by its destruction of husbands and fathers, makes 45,445 widows and orphans in England and Wales every year, or over 124 every day. These figures are an under-statement, for they do not recognize the fact that the mortality due to alcohol is really much higher among men than women.

"We have in this country an infant mortality of about one hundred thousand per annum,

and a mortality of infants before birth which is at least as high. It is estimated that not less than half of this ante-natal mortality, namely, fifty thousand lives per annum, is due to syphilis. Over the whole of this colossal loss of life, before and soon after birth, amounting to not less than 200,000 lives annually, is the trail of alcohol, either doing its deadly work hand in hand with syphilis or destroying life directly on its own account.

"Obviously, therefore, the abolition of the mortality directly and indirectly due to alcohol would vastly more than compensate for the unprecedented loss of life due to the deadliest war in history."

**WAR RELIEF FUNDS.**—On Nov. 4 the totals of the principal New England relief funds for the European War reached the following amounts:

Belgian Fund .....	\$162,906.12
French Wounded Fund .....	131,312.85
Armenian Fund .....	105,681.21
Serbian Fund .....	104,649.07
Surgical Dressings Fund .....	55,259.66
Polish Fund .....	46,748.78
Italian Fund .....	26,358.54
Permanent Blind Fund .....	21,310.94
Prince of Wales Fund .....	16,015.68
P. S. D. Fund .....	9,814.63
French Phthisis Fund .....	5,834.50

#### BOSTON AND NEW ENGLAND.

**WEEK'S DEATH RATE IN BOSTON.**—During the week ending Saturday noon, Nov. 4, 1916, the number of deaths reported was 222, against 205 for the same period last year, with a rate of 15.22 against 14.28 last year. There were 36 deaths under one year of age, against 39 last year, and 61 deaths over 60 years of age, against 62 last year.

The number of cases of principal reportable diseases were; diphtheria, 39; whooping cough, 4; scarlet fever, 13; typhoid fever, 2; measles, 14; tuberculosis, 32.

Included in the above were the following cases of non-residents: diphtheria, 9; scarlet fever, 3; typhoid fever, 1; tuberculosis, 5.

Total deaths from these diseases were: diphtheria, 5; measles, 1; whooping cough, 1; tuberculosis, 16.

Included in the above were the following deaths of non-residents: diphtheria, 1.

**BOSTON ASSOCIATION FOR THE RELIEF AND CONTROL OF TUBERCULOSIS.**—The Annual Meeting of the Boston Association for the Relief and Control of Tuberculosis is to be held at the Twentieth Century Club, Boston, on Friday, November 10, at 3.30 p.m.

The three leading speakers are Edward R. Baldwin, M.D., director of the Saranac Lake



Laboratory and president of the National Association for the Study and Prevention of Tuberculosis; Homer Folks, LL.D., director of the National Association and secretary of the State Charities Aid Association of New York; and Lee K. Frankel, Ph.D., sixth vice-president of the Metropolitan Life Insurance Company.

The subject to be treated is "Tuberculosis from the Medical, Social and Industrial Point of View," Dr. Baldwin speaking from the medical point of view, Mr. Folks from the social and Mr. Frankel from the industrial. The meeting should be of unusual interest to physicians. It is open to the public.

**BERI-BERI IN NEW BEDFORD.**—Report from New Bedford, Mass., states that on October 24, six cases of beri-beri were discovered aboard a schooner recently arrived in that port from the West African coast. The patients were the captain, two officers and three sailors of the crew.

**REPORT OF BOSTON HEALTH DEPARTMENT.**—A recently published monthly bulletin of the Boston Health Department contains data showing a considerably larger total mortality in this city during the first nine months of this year than during the corresponding period in 1915. The following abstract of the report indicates the distribution of this mortality.

"Total deaths in Boston for the thirty-nine weeks of this year are 10,054, compared with 9337 for 1915. Non-resident deaths, included in the total, have so far numbered 1373, as compared with 1269 a year ago. Pneumonia has claimed 1308 victims this year, as against 1127 last year; cancer, 679 this year, compared with 708 last year; heart disease, 1355 this year, compared with 1245 last year; diarrhea and enteritis, under two years, 300 this year, compared with 348 last year.

"Deaths from communicable diseases fall slightly lower than last year's total, with infantile paralysis excluded. There have been 1212 such deaths this year, compared with 1230 a year ago. Diphtheria last year resulted in 175 deaths. So far this year there have been 137. Scarlet fever last year resulted in 75 deaths, and only 34 this year. Measles last year resulted in 32 deaths, and this year 91. Typhoid fever last year was responsible for 31 deaths, and this year the number has been 13. Whooping cough last year claimed 73 deaths and this year 60. Tuberculosis last year resulted in 841 deaths and this year 877.

"This has been a very active year with measles, a total of 5128 cases having been reported, compared with 4824 last year. This is the only instance that the total in communicable diseases was larger than last year. Diphtheria shows a falling off of 363 cases; scarlet fever, 1042; typhoid fever, 127; whooping cough, 248; and tuberculosis, 160."

## Obituary.

### DAVID FRANCIS LINCOLN, M.D.

WITH the death of Dr. David F. Lincoln, which occurred suddenly on Tuesday, October 17, there passed away a man who deserves well to be remembered by the medical profession of this city. But few remain who could call themselves, in a distinctive sense, his colleagues; and the life that he had led for many years before his death was so quiet, and so remote from the world of modern medicine, that the younger members of our fraternity have had little opportunity to become familiar even with his name, much less to make themselves aware of his fine qualities of heart and mind.

Dr. Lincoln was born in Boston on January 4, 1841, and received his primary and secondary education in our Boston schools. He entered Harvard College at the age of sixteen, with the Class of '61, in company with many men who afterward became distinguished. Those whom I happen to associate especially with him are Henry P. Bowditch, Wendell P. Garrison, N. P. Hallowell, James K. Stone, and Edward Wigglesworth; but class feeling in general was strong in him. Then, as later, he was shy, quiet, and retiring, but he always commanded the respect and friendship of the best of his associates.

Graduating just as the Civil War broke out, he enlisted in the Navy, remaining in that service for a period of one and one-half years. He then studied medicine in the Harvard Medical School, and in 1865 served as house officer at the Boston City Hospital, in company with Drs. Edward G. Loring, Michael Gavin, John Dole and Clarence J. Blake. A trip to Europe followed, and he spent two years there in medical study, leaning toward the specialty of neurology. It was at this time that I first learned to know him well, and became attracted to him for the independence, loyalty, and intrinsic interest of his character.

After his return to America, Dr. Lincoln practiced medicine for several years, as a specialist in neurology. It soon became evident, however, both to him and to his friends, that, with his habit of silence on the one side, and blunt speech on the other, he was not likely to make his way as a practitioner, although every one who knew him well recognized, underneath his exterior of silence, remarkable qualities of learning, gentleness, even playfulness, and broad, kindly interests in humanity.

Finding that medicine did not go, he tried his hand at teaching, for which in certain ways he was well fitted. Latin and Greek were his specialties in this profession, and he taught them in private schools and also at Hobart College in the pleasant town of Geneva, N. Y., where he filled an important position, with happiness and success.

Returning to Boston, he occupied himself



with various matters referring to public health and hygiene. A very early and warm friend of his was the late Mr. James M. Barnard, who, like himself, was an ardent and single-minded lover of progress and a man who worked better upon his own lines than in harness with other men. For several years these two served as the president and secretary and chief helpers of a society devoted to the interests of public health, to which a number of other friends of Dr. Lincoln, including myself, also belonged.

For many years Dr. Lincoln was a true friend and helper of the George Junior Republic, where he made frequent visits, and with the workings of which he made himself intimately familiar. At the same time he espoused the cause of backward children in the public schools, spending a great deal of time in the actual teaching of certain of them, and doing what he could to see that the needs of all were appreciated and met.

For a good many years before his death he lived in small and very modest quarters on one of the quiet little streets of Beacon Hill, better known to our ancestors than to ourselves, and here he made himself the personal friend, to a degree that but few even of those who stood nearest to him were aware, of many children whose acquaintance he had made either in the schools or in the neighborhood of his rooms. He had long been in the habit of working in the North End Union, with Mr. Samuel F. Hubbard, and his neighborhood work was a logical extension of this. These children, of various nationalities and color, he stimulated to read and study, and aided to form clubs. Altogether, he played a part in their restricted lives which was of priceless benefit to them, and the affection they gave him testified to their appreciation.

Dr. Lincoln was always a reader and a student, and he had a first-rate power of literary appreciation and criticism. This, together with the genuineness of his interests, made him a very agreeable talker on all matters which he had set himself to study.

On the morning of October 17 he was found sitting in his chair, so quietly, and with such a natural expression, that it seemed, at first, impossible to think of him as dead. His books and papers were around him, and his relatives who took charge of them found a number of charming bits of writing of which they had not known.

His only published work of any magnitude, so far as I remember, was a compendium of physiology, for use in schools. This was an excellent book and filled a real need.

But quietly though he lived, the part which he played in the community was real and important, and one could say of him with warmth and emphasis,

"Nec vixit male qui natus moriensque fefellit."

JAMES J. PUTNAM.

## Correspondence.

### THE PROPAGANDA OF ANTI-VACCINATION.

Worcester, Oct. 30, 1916.

Mr. Editor:—

The enclosed letter with its startling contribution to the etiology of infantile paralysis deserves publicity were it only to emphasize the colossal impudence of the person who signed it.

Its third paragraph does, however, state the exact truth and I wish at this time to call upon every member of the Massachusetts Medical Society to constitute him- or herself a committee of one to interview those who are to be members of the next legislature, to impress upon them the importance of retaining the present law and the punishment sure to follow its repeal.

Very sincerely,

SAMUEL B. WOODWARD, M.D., *President*,  
Massachusetts Medical Society.

720 Tremont Temple, Boston, Mass.,

Oct. 20, 1916.

Dear Dr. Woodward:—

The psychological moment to repeal the Compulsory Vaccination Law is the next session of the Legislature,—owing to the tremendous excitement over infantile paralysis which many experts believe is the inevitable outcome of generations of vaccination.

We need money. If everyone in sympathy with our cause will do what they can to help we can win out this year!

Last year we practically won with a vote of 127 in our favor to 105 against, at the second reading of the bill. This was the largest roll-call in the history of the commonwealth, not even excepting the election of the Speaker of the House. I mention this to show you the tremendous interest in and pressure brought to bear on our measure. At the third reading of the bill the opposition brought every ounce of their power against us, and we only lost by a few votes. Therefore we have reason to feel proud of the splendid fight we made!

We must have funds for office expenses, for a paid worker to cover the state, which means traveling expenses, literature, etc.; all of which counts up.

As in past years, I stand ready to do all the stenographic work gratis. But to win I must be relieved of financial worry which I have cheerfully borne for so many years.

Won't you make a special effort to let your contribution be so large that we can win out this year and be forever rid of this unjust law? May we hear from you at once so that we may push matters all over the state before the legislature convenes?

Faithfully yours,

JESSICA L. C. HENDERSON, *Vice-President*,  
Anti-Vaccination League of America.

### ERRATUM.

In the issue of the JOURNAL for October 26, 1916, (Vol. CLXXV, p. 589) there was an error in the second table in the second column, entitled "Percentage of Total Cases." The first figure in the third column should be "37" instead of "7," so that the table should read as follows:

#### PERCENTAGE OF TOTAL CASES.

	Under 5	5-10	Over 10
Rural Group .....	37	26	37
North Adams .....	76	24	0



# The Boston Medical and Surgical Journal

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## Address.

### MENTAL PITFALLS OF ADOLESCENCE.\*

BY HENRY R. STEDMAN, M.D.

*Bournewood Hospital, Brookline, Mass.*

So many conditions make for soundness of mind that the field of mental hygiene is a large one; but of all its aspects, none is of more vital importance than its application to the young adult. I shall endeavor, therefore, to give you some idea of the extent, nature and outcome of mental breakdown in youth, its principal causes and the possibilities in the way of its prevention which lie open to the parent, the teacher, the clergyman and the general physician. Widespread information on the subject is plainly called for in view of the large number of youths and girls who are annually admitted to our state and private hospitals for mental disease, and the ignorance of the general public as regards the special form of the disorder which is peculiar to adolescence.

The knowledge and application of the rules of bodily hygiene have, as everyone knows, long protected the adolescent from physical weakness, disease and injury. He is equally well guarded by private and public advice, training and example in the home, the school and the church against moral degeneration. Against ignorance he is educated in this country as in no other. But, against mental deterioration and

breakdown, little or no warning or advice is given him or his parents, as a rule, until he is placed under care in an institution.

Facts about physical disease come home to us. We are familiar with it from everyday observation and experience. We are impressed with accounts of its dangers, its terrors, perhaps, and the numbers of its victims. Mental disease, on the contrary, the most grievous of all diseases, though it may horrify in the abstract, seems very remote as a possibility in our own cases. It is usually the very last calamity we expect to have happen in the family and therefore no precautions are taken against it. If it were not necessary, because of the nature of their illness, to "put away" the mentally afflicted; if the secrecy about their condition, as though it were a disgrace instead of a disease contracted through no fault of their own, did not exist, people would be equally alive to the ravages of mental disease and the importance of the study and application of mental hygiene, or the science of mental health.

### THE FREQUENCY OF DEMENTIA PRÆCOX AND ALLIED CONDITIONS.

How common is morbid mental change in youth, varying from minor states of instability to actual insanity, cannot be stated in percentages. Its lighter shades, although materially affecting the future life of the patient, rarely come under the eye of the institution physician, except in the psychopathic hospital, where incipient and borderline cases are numerous, although full opportunity for their observation and treatment is limited even there. Often the

\* A Popular Lecture delivered under the auspices of the Massachusetts Society for Mental Hygiene in various cities and towns of the State during 1915-1916.



family physician is not consulted for these mild conditions, and when he is he either fails to recognize the disorder or belittles its importance. Consequently there is probably a large number of such persons in danger of mental breakdown who are without advice or other assistance.

But simply taking the known cases of the fully developed disease, the showing is impressive. It is safe to say that the majority of the 14,746 inmates of the Massachusetts state and private hospitals for the insane are cases—mostly chronic—whose disease began when they were young. They had then reached the end of the intellectual lives of which they were capable, became stranded on the rocks of adolescence, and were left mentally incapacitated for life. Of the 3264 *new* cases of mental disease admitted to the Massachusetts hospitals in 1915, 804, or over 21%, were suffering from dementia precox (as the disease we are considering is called) and allied conditions of adolescence. This yearly addition of cases of dementia precox, most of whom become chronic but remain physically well, causes them to accumulate until they soon form the majority of the inmates of our state hospitals. They represent one-third more admissions than the combined totals of all patients whose mental condition is due either to alcohol or syphilis—causes which are very rarely operative in producing this form of mental disease. Of all the classified forms of insanity, moreover, dementia precox claims by far the greatest number of victims.

Here let me say that this mental condition should not be confounded with mental defect or feeble-mindedness proper. It is important to bear this in mind. The mental defective, about whom wide public interest fortunately has at last been awakened, is one who had little or no mind to start with—who has been idiotic or imbecile from birth or infancy. On the contrary, most cases of dementia precox enjoy, up to the time of their breakdown, apparently sound and normal minds. A striking fact is the frequency with which the disease attacks adolescents of marked intelligence and promise. A German authority reports that large numbers of such patients are schoolmasters, the sons of schoolmasters and theologians. Statistics on this point give these figures: 27% men and 21% women had average intelligence before their mental breakdown; 55% men and 66% women had good and even remarkable intelligence; 18% men and 13% women were below the average intelligence, but were not mentally defective.

#### NATURE OF THE DISEASE.

Adolescence, by far the most critical period of mental life, extends approximately from the age of 15 to that of 25. It is in this developmental period, usually towards the end, that dementia precox, the form of mental disorder which is peculiar to youth, begins. It only rarely hap-

pens that it originates later than the completion of adolescence, although in some individuals full mental maturity is not reached before 30. Its name is derived from dementia, which denotes deterioration of the mind through loss of mental power, and precox, premature. In its essence it is an enfeebling of the previously healthy mind, a slow decline of mental strength through gradual weakening of the will and deadening of the emotions or mental feelings. It ends, generally after a few years, in permanent degeneration of the mind, sometimes light but more often pronounced and involving it in more or less complete disorganization. At the outset and throughout the course of the disorder may occur various kinds of mental disturbance appearing as "attacks," such as maniacal excitement, melancholic frenzy, simple depression, states of bodily rigidity (called catatonia), stupor, confusion of ideas and delusional states. Hallucinations, such as seeing or hearing non-existent sights or sounds, and sudden impulsive acts of homicidal or suicidal violence, are not uncommon. These manifestations do not all occur in the same attack although several of them may be combined in a single case.

#### FORMS.

The disease has been divided into several different sub-varieties, but I will only call attention to the simple form which, because of its mild nature, is more frequently met with outside the hospital. The other more pronounced and severe types, common in hospitals, need no further mention. These cases of simple dementia are far less striking and very insidious in their development. The principal feature is change in the youth's character, in the shape of a gradually developing mild apathy and indifference. If in good circumstances, he usually spends his life in indolence, varied by spasmodic and aimless activity, and tends to develop obsessions, antagonisms and anti-social proclivities. The poorer patient so afflicted is often a tramp, a crank, a criminal or a prostitute in the making. The "hobo" class is largely recruited from these mental derelicts. Wilmans, in 127 vagabonds, found 66 cases of dementia precox. This form is a common one, but most of the cases do not reach the hospital for the insane.

#### ITS APPROACH.

Familiarity with the premonitory symptoms of dementia precox is most important, as it is more than likely to be very helpful toward checking or minimizing further trouble if medical advice is sought in time. Therefore, I shall not apologize for giving them in detail. The early indications of the disease, which appear gradually, as a rule, are practically the same whatever form it may afterward assume. In all of my cases, in which intimate knowledge of the earliest manifestations was attainable, lapse in the power of attention—of mental concentration



—has come first. An ambitious student complains: "I cannot any longer wield my mind, which has become my master instead of I being master of it"; "I feel no exuberance as before"; "Everything is a dead weight"; "The feeling clings to me and I cannot fight it off." A bright lad, taking high rank in a preparatory school, grows despondent at finding himself becoming "dull," "stupid," and "weak," and begs to be helped, as his utmost endeavors to go on have failed. The girl in this situation feels for the first time that "she must *struggle* to be like other girls." The patient also becomes more easily fatigued physically than before and loses directive energy and initiative. With increasing mental failure the fruitless efforts are soon abandoned, the mind becomes more inactive, forgetfulness, depression and indolence replacing alertness, ambition and energy. He "wants to be let alone," becomes listless, apathetic, and careless, gradually slipping into a dulled condition of mind. Many become over-conscientious, depressed and self-reproachful. Avoidance of others follows and paves the way for suspicion of those about them, the starting-point it may be of future hallucinations, delusions, and overt acts. Suicidal thoughts may now appear. Adolescent patients of another type, when no longer able to meet even the minor demands of life, and physically fatigued, become easily upset and very irritable, as well as unexpectedly fault-finding and very angry over trifling matters. Marked indecision and constant demand for reassurance regarding the plainest matters of duty are common.

The train of thought naturally becomes interrupted early and may even show signs of the approaching mental confusion of the next and active stage of the disease. Lapse in judgment is shown in the development of unnatural prejudices, sudden and needless alarm at ordinary occurrences. Some patients begin by worrying over their physical condition, believing that their bodies or some bodily functions have undergone a change. Self-control may be early undermined, and strange conduct follows, such, for example, as unnatural and even grotesque infatuations, indiscriminate proposals of marriage, etc.

Sudden and unexpected acts, forerunners of the more pronounced impulsive states of the acute stage, are common, such as exhausting walks with no object after a long period of idleness; unexplained destruction of belongings, etc. Unlooked for transitions of mood and the lack of depth in the patient's depression or anger, characteristic features of the disease through its entire course, are early manifestations, as are also inconsequential speech and aimless effort.

The general appearance of the patient is that of apathy or mild depression, except at times of unexpected and transient animation. Lack of

energy also is constant, except during spasmodic outbursts of misdirected activity or prolonged over-work or exercise. Although such patients, owing to irregular ways of living, sleep more in the daytime, insomnia is developed early. The appetite is capricious. Headache is frequent, and, as Mairet believes, a highly important symptom at this juncture. It is sometimes a severe, persistent and protracted pain, but more often a disagreeable, vague sensation as if, for example, the head were "empty" or "filled with cotton wool." Nightmare is common. A generally weakened, relaxed, poorly nourished bodily condition is usual and is shown in loss of weight, pallor, dilated pupils, low temperature and weak pulse. Menstrual irregularities are rather frequent. In not a few cases the group of premonitory symptoms bears a deceptive resemblance to neurasthenia proper or "nervous prostration," owing to the predominance, for quite a long period, of nervous and bodily debility.

#### THE SOURCES OF DEMENTIA PRECOX.

Authorities differ as to the prime cause of the disease, one group favoring a physical, the other a psychic origin; but wherever its germ, so to speak, may lie, the character of the mental soil in which it takes root and flourishes and the conditions which excite it to full development are well known to the psychiatrist.

One of the profoundest, although more remote, influences in originating dementia precox is the time of life in which the disease prevails,—the period of puberty and adolescence, of growth, development, immaturity. Almost all modern writers on psychiatry, even those who lay special stress on the influence of faulty heredity, are fully alive to the great importance of this critical time of life in fostering mental disease, and in all probability we shall have to seek for the real causes of its origin in the normal physical and mental variations of this period of development.

To appreciate the possibilities of this time of life in the way of mental deterioration we have only to call to mind the unusually rapid growth of the organism in every tissue, the new and powerful activity of all the functions, especially those of nutrition, in the progress toward complete development, and the stamina and often the care that are essential for properly meeting the demands of this revolutionary period. The disturbance of the heretofore tranquil nervous system by the advent of the reproductive functions is a vital change, and the proper adjustment of this part of the organism to the working whole is of far-reaching importance, as the genital activities have a profound effect on the entire system and the developing personality. During adolescence the normal mental condition is not a solidly settled one, and at this time, if ever, should we expect to find pathological disturbance when impressionability, instability of



purpose, variation of mood, excitability, impulsiveness, ambition, independence, and intolerance are most likely to be in full play; when the affections, emotions, and newly awakened sexual feelings and passions are most keen; when reflection and judgment are immature, and, above all, when self-control, which should regulate all, is itself in an imperfect stage and in danger of being unequal to its function. Nothing is more significant of the causative influence of this period than the resemblance of the clinical picture of dementia precox to these ordinary mental elements of normal development which in morbidly exaggerated form constitute the different manifestations and phases of the malady.

When to this developmental factor is added the special mental make-up, sometimes improperly called temperament, of many of these patients, the soil is thoroughly prepared for the growth of the disease. From childhood these individuals are, as a rule, well behaved and easily trained because they shun opposition and struggles from lack of normal vigor and strength of purpose rather than from any inherent virtue. Their tendency to shrink from coping with the world, due to a faulty habit of adjustment, resolves itself into the "shut-in" personality which typifies these cases. This factor, so important in determining the causation and prevention of the disorder, was first recognized by Meyer and August Hoch who found that a large number of cases occurred in persons who, as Hoch puts it, had "no natural tendency to be open and to get into contact with people and things about them, who were reticent and exclusive and could not adapt themselves to situations, who were hard to influence and often sensitive and stubborn, but the latter more in a passive than an active way. They showed little interest in what went on and frequently did not participate in the pleasures, cares and pursuits of those about them; although often sensitive they did not let others know what their mental conflicts were; did not unburden their minds, were shy and had a tendency to live in a world of fancies."

Many of these sensitive natures suffer in silence at their imagined inferiority, always expecting to fail in their efforts to please others or to succeed in their studies or whatever they may undertake. Their pride is easily wounded and they are ever ready to believe themselves slighted. They are excessively over-conscientious, magnify their faults and mistakes, and live in constant fear of what people will think of them. Consequently remorse and shame cause them much suffering except when their troubles are crowded out for the time by everyday duties. Their diffidence and exclusiveness too often pass among their young friends for haughtiness and self-conceit and thereby cause criticism from others—the very thing which they are so anxious to avoid. Submerged and repressed factors which occasionally torment the

adolescent of this type and which the psychoanalyst tries to bring to light and correct are early sexual experiences which are usually exaggerated. The constant and often growing mental conflict caused by the repression of these thoughts is an added strain which is sometimes the precipitating cause of nervous breakdown. Then, too, these youths tend to dwell upon ordinary longings which the normal mind ponders on but puts aside. Hoch found the "shut-in" personality markedly pronounced in 35% and indicated in 16% out of 72 cases of dementia precox.

Another type is the precocious youth, the student who is more or less of a prodigy, a phenomenon. Such subjects are particularly prone to mental breakdown in adolescence owing to the readiness with which their abnormally active minds may be over-stimulated in every direction.

One cannot fail to be impressed also, with the large number of cases of dementia precox which present a family history of mental or nervous disease. Nevertheless many distinguished psychiatrists deny that disease-heredity is a powerful predisposing influence. Kraepelin, the foremost authority on the subject, comes to no definite conclusion on this point, but seems to be opposed to regarding this disorder as a form of degeneracy. He points out that heredity does not appear to be more frequent in dementia precox than in certain other mental diseases and that the best known constitutional disorders, such as hysteria, manic-depressive insanity and psychopathic states do not lead to a mental deterioration but to a periodic recurrence of symptoms with intervals of perfect health which are often long. Statistics on this point are quite diverse.

Badly directed education, moral and mental, may give a wrong turn to the tendencies of the nervous child and thus leave him with little defence against the exciting causes of mental disease when adolescence is reached.

#### PRECIPITATING CAUSES.

The precipitating causes are various, but for the most part are of the nature of exhausting influences—mental and physical strain. These are the most conspicuous and powerful of the exciting causes of the disease. Rapidly-growing youth or girls in the humbler walks of life, apprentices, clerks, train hands, stable boys, mill operatives, domestics—often succumb to the exhausting effects of hard and continuous physical labor combined with long hours, anxiety, little sleep, insufficient food and in consequence disorder of nutrition. Insomnia and lassitude arise and mental breakdown follows, sometimes apparently without the aid of any predisposition to mental disease. Youthful volunteers not inured to military discipline and the hardship and dangers of active service also recruit the ranks of the youthful insane. Social strain in girls



with its attendant factors of malnutrition and fatigue as well as banting may precipitate mental breakdown in predisposed cases. Over-study, of itself rarely productive of mental disorder, causes many a delicate girl or lad of the "shut-in" type to succumb to mental disease when poor circumstances increase the struggle for education. Rapid and excessive growth in height, without corresponding weight and proportionate development, is recognized as abnormal. It is not uncommon in this type of adolescent and may sometimes precede by a little the development of the disease. In these instances there is not sufficient alimentation provided to meet the demand of the growth of the organism *plus* excessive mental and bodily energy.

Self-abuse, if the degrading habit be carried to great excess, and if the child or youth be of the nervous type, is apt to be exhausting and to cause general depression and languor, lessened power of attention, poor memory and dullness; but as ordinarily practised,—and the habit is well-nigh universal in youth,—its results, according to accepted medical teaching, are, as a rule, not so directly disastrous as was formerly believed to be the case, and are more often moral than physical or mental. Contrary to popular belief, masturbation is almost never the cause of mental disease or defect. Melancholy subjects of dementia precox, with delusions of wrongdoing and general worthlessness, often accuse themselves of previous excess in the vicious habit who on recovery admit that they had seldom practised it. Many of its symptoms are purely nervous in character, and are due to shame, anxiety and loss of self-respect, due to a consciousness of a debasing weakness which is universally condemned.

Typhoid and other debilitating diseases occasionally leave the patient in a permanently weakened mental condition culminating in dementia precox. Child-birth and its attendant conditions, with its many disturbing influences, is sometimes the starting point of mental breakdown. Aschaffenburg found 56 cases of dementia precox in 118 cases of so-called "puerperal insanity." Finally, it may be impossible to find any adequate cause for the attack, a small proportion of the cases occurring in the physically strong and apparently stable and socially inclined.

—EX.

No reliable data have thus far been recorded which indicate in which sex the disease is more common. Not a few authors find the disease more prevalent in young men.

#### THE PROGRESS OF THE DISEASE.

There is the greatest variation in the manner in which the disease may progress. In the great majority of cases the first attack may be and usually is more or less pronounced and severe and lasts all the way from three to eight months or a

year, to be succeeded by a remission of symptoms to such an extent that the patient appears to be entirely well and is able, it may be, to live at home. After a time, however, sometimes a year or more, he begins to become easily exhausted in mind and body, sleeplessness sets in and a relapse occurs with deeper dementia though somewhat less acute symptoms. From this attack also he may emerge but, with the mind on a still lower level of strength and rationality, he again relapses and finally the mind permanently succumbs. Others do not have separate attacks but gradually sink into permanent dementia. A large proportion of cases never recover their reason although their physical health becomes and remains good and even excellent.

These temporary recoveries are frequent in dementia precox but substantial recoveries are much more common in other forms of mental disorder. Nevertheless, a certain proportion of dementia precox cases, once estimated by Kraepelin at 13%, appear to get well permanently after one attack and continue ever after to fill their accustomed stations in life to a large extent as well as before, although, as a rule, they never appear entirely the same in the opinions of near relatives in some detail of endurance, judgment or conduct. Other victims of the disease may live on comfortably outside of the hospital but are plainly on a lower mental level than those about them and are regarded as "non-compos." The remainder become irretrievably demented, inactive in mind and body, automatic in their movements and of varying degrees of helplessness, requiring more or less constant personal care. This class of patients, particularly serve to swell the constantly accumulating aggregations of chronic patients in our institutions.

#### EFFECTS OF TREATMENT.

Improved methods have, of late years, unquestionably tended to benefit the condition of these patients and increased the number of recoveries in our custodial state hospitals. Nevertheless, aside from protecting the patients from neglect, injury to themselves and others and the disturbing influences of outside life, securing their physical well-being and providing occupations and occasional diversions (and a vast amount of excellent work is done in these directions), comparatively few curative results are possible for the majority of them where large numbers are cared for together. It is in the treatment of the individual patient that the chances of recovery or improvement are greatest, and the nearer we can approach to this wherever the mental case is under care the better will be the results. By employing resident social workers who interest themselves in the individual patient and his affairs, and increasing the number of nurses, the superintendents of our institutions are now making more progress in this direction.



## THE OUTLOOK.

This is indeed a gloomy picture. It has its counterpart in the condition of sufferers from tuberculosis before the public interest in the subject was awakened and a crusade begun to prevent its ravages. Compare the situation of the consumptive of that day and this. What remarkable progress has resulted in public enlightenment in hygienic measures for the prevention of the disease, in general recognition of its earliest symptoms and in advanced methods of treating the developed disease. At that time it was generally looked upon as an incurable disorder. Once the diagnosis had been made of phthisis, as consumption was then called, the patient was supposed to be doomed. Now recoveries are not only frequent but expected when the case is taken in season, and when relapses occur the intervals of health are prolonged under comfortable conditions by our modern means. Statistics tell the story of the diminution of deaths from this cause of late years. In the early days of the movement no one would have ventured to predict such a general public awakening and such encouraging results.

The situation is to a considerable extent the same as regards mental disease, and the outcome, though less pronounced, will be no less surprising if the mental hygiene movement, both national and state, which is now in its infancy, shall take an equal hold upon the sympathies and interest of the public.

## IMPORTANCE AND MEANS OF PREVENTION.

The chief aim of such organized effort should be the adoption of preventive measures, as they are the main reliance, the anchor to windward against the disease. As a means of combating it, they are infinitely more effective than treatment instituted after it has once gained a foothold; and it is here that the help of parents, teachers and general physicians is indispensable. Familiarity with the remote influences, the precipitating causes and the earliest symptoms of mental deterioration in adolescence is of great value, and not only, be it understood, in warding off the malady but also, by the way, in throwing much light on the traits and trends of the minds of youths and girls who are normal and sound in mind and body. No one has made this plainer than Stanley Hall, our foremost authority on the psychology of adolescence. "One of the missing links," he says, "which are indispensable to full acquaintance with the many forms of precocious mental decay, is the absence of record or available knowledge of the early stages in the development of the disease before cases come to asylums; for of this disease, even more than of many others, it is certain that if all were known, its manifestations would be found to be numerous in proportion as they are mild, and that the vast majority who are slightly impaired by the ferment of this storm and stress

period of life never come under any kind of medical observation. For one I incline to the opinion that just in proportion as these gaps are filled we shall have less need of recourse, with Kraepelin, to toxic and other chemical ease. The paradigms of premature decay," by which he means its parallelisms with the manifestations of the inner and outer life of normal youth, "reveal a body of phenomena of the highest importance for normal genetic psychology, and it should be asserted that no parent, judge, family or army physician, and especially no teacher, should be ignorant of these morbid forms which, in their mild degrees, are so common and the key to so much that is normal, but which are generally concealed to others and often unconscious to self."

Now, mental, like physical, illness, comprises many different "diseases"—between 35 and 40 all told. Some are more curable than others, and some are inevitably hopeless. Dementia precox has been placed, and rightly so, if we have regard only to *past* results, between the two, that is, in the less curable class, but that should not be taken to mean, by any means, that it is not preventable. On the contrary, it is now accepted by those expert in the subject that much of the disease may and should be prevented.

As Campbell of the Johns Hopkins Hospital puts it: "the researches of Kraepelin, Freud and Jung of Germany, and Meyer and Hoch in this country, show that under proper guidance and control many cases of functional nervous disease and insanity are of such a nature as to be manageable and preventable. It is clearly obvious that, of the enormous number of persons who, as a result of hereditary tendencies, are susceptible to nervous and mental breakdown, many could be saved by proper assistance during the developmental stage." Among the preventable conditions which he considers the most hopeful he places dementia precox first. He classes 39% as manageable and preventable.

Unfortunately, the theory of degeneracy has become so deeply ingrained in people's minds that a surprisingly large number still believe that all mental disease is on a par with idioey and imbecility and that it not only cannot be really cured but is impossible of prevention except in some future generation through the admixture of healthy stock. We have far too long lain back content in the belief that it is one of nature's methods of weeding out the unfit, and the mental weakening of this type has been excused for giving rein to his morbid tendencies and his guidance neglected because his father or mother was a criminal and inebriate or insane. It is largely for these reasons that no systematic scheme of prevention has ever been tried for the insane until the recent public instruction in mental hygiene was undertaken.

The practising psychiatrist and the neurologist not infrequently are consulted by patients



with unmistakable symptoms of approaching dementia precox in its very earliest stage, and not a few, under close supervision, change to healthful open-air and congenial but quiet surroundings, suitable companionship and careful following up of their cases, have been restored to rationality, calm of mind and enjoyment of life. Some seem to have recovered; others, if they have not been fully brought up to their original mental level, are at least able to be of some use in the community. In this way occasional cases that seemed doomed to lifelong commitment to a hospital for the insane have been saved. So far as they go, therefore, these results constitute object lessons of the effects of prevention. So, too, the intervals of comparative health occurring between attacks are frequently prolonged when the patient is kept track of by the physician and led to make frequent reports of his progress. In this way relapses may be warded off for a much greater length of time than would have been the case without such supervision. But prevention from this source cannot go far as it is comparatively seldom that such cases reach the physician in time owing to the prevailing ignorance of the danger signals or the refusal of the patient to cooperate. Fortunately, psychopathic hospitals and wards are now receiving more of these early cases, which formerly would have shrunk from going to a state hospital.

Nor should we wait until medical advice seems necessary. It is just here that the help of the parent and teacher may be of the utmost service. They should not only make themselves familiar with the signs of its approach in order to summon medical help in time, but should strive to familiarize themselves with the morbid tendencies that I have endeavored to describe, so that, when possible, they may so direct the lives of their charges that strain and other dangers to young minds predisposed by heredity or temperament to breakdown may be avoided. The "shut-in" type of lad or girl, in which the disease takes root most quickly and frequently, should be generally recognized. It should become a matter of common knowledge that just as a special physical make-up or conformation may betoken tuberculosis so there is in many cases of dementia precox a particular kind of personality which favors its development and calls for precaution in the way of training, environment and mental and physical hygiene. In families of the ignorant and unthinking these danger signals pass unnoticed, but intelligent people may learn the lesson and profit by it, if it be brought to popular knowledge as an accepted scientific fact.

Every endeavor should be made to pierce the shell of secretiveness which envelops these minds, to gain their confidence, and without too much preaching explain to them how needless are their self-depreciation and their fears; how exaggerated are their ideas of

past experiences, especially the sexual, and how mistaken they are as regards their consequences. Girls should have the nature of menstruation and the precautions it necessitates early made plain to them. Boys should be led to look upon occasional seminal losses during sleep as a natural occurrence. Many a frightened youth, for want of a father's foresight and prudence in this direction, has fallen into the hands of quacks, who have worked upon the fears of their victims until they have become morbidly depressed and hypochondriacal. Parents should also see to it that their children are kept from the first in the companionship of other children and take part in the healthy pursuits and pleasures of their mates. They should endeavor to implant normal mental processes in incipient cases and regulate their methods of thought, study, reading, exercise and conduct.

But these means of prevention are often difficult to put into effect in dealing with such inaccessible natures, although they should never be neglected. Fortunately there are other and more tangible means of strengthening the resistive power against morbid tendencies in the direction of bodily nutrition and development and regulation of physical and mental effort in the school, in sports, in the family, in society and in other activities.

To begin with, it is important that special attention should be paid to the accumulation of a reserve fund of bodily nutrition with which to sustain the growing system, especially of the delicate youth, and protect it against physical or mental fatigue. Every possible means should be availed of to prevent such subjects from acquiring the habit of taking irregular, insufficient and unwholesome food. They are liable to develop lasting hypochondriacal fancies which might never arise if they had been trained early in this direction. Louis Starr, writing on the adolescent period, recognizes this danger and believes that bad eating habits lead to many breakdowns of students and cause irritability, anemia, malnutrition and a condition of weakness in which marked fatigue follows such trifling exertion that exercise is precluded and a craving for stimulants engendered. It is essential, therefore, to establish an appropriate diet during puberty. If correction be neglected until after sex development be completed little improvement can be expected. A great many young people are inadequately fed, especially the only child, who is supposed to be delicate. Tracy and Crossdale, in a series of observation tests made during the past year upon 127 typical students at the Philadelphia Normal School for Girls, found that only about one-third of them took three substantial meals a day while the rest depended too largely on hastily-scattered breakfasts and lunches of sweets and pastry and often missed meals altogether. The effect of these habits was easily seen in the general health of the students. There



was a distinct difference in the powers of endurance and vitality of certain girls whose diet was more solid and substantial than the others. Much more does the rapid growth of the young and their enormous and incessant activity of body and mind demand a full and regular supply of nutritious fuel, and they can hardly eat too much. This is especially true of the nervous child who should never be stinted and always encouraged, but never nagged, to eat plenty of all kinds of nutritious food, avoiding perhaps too marked a preference for meats.

The general principles of prevention laid down by Sir Thomas Clouston, the famous Scotch psychiatrist, are practical and to the point. "Build up the bone and fat and muscle by means known to us during the period of growth and development. Make fresh air the breath of life of the young. Develop lower centers rather than higher where there is a bad heredity. Do not cultivate, rather restrain, the imaginative and artistic faculties and sensitiveness and the idealisms generally in cases where such tend to appear too early and too keenly. They will be rooted in a better brain and body bases if they come later. Cultivate and insist upon an orderliness and method in all things. The weakly neurotic are always disorderly, unbusiness-like and unsystematic. Fatness, self-control, and orderliness are the three most important qualities for them to aim at."

I have alluded to the occurrence of attacks of so-called "nervous prostration" during adolescence. They are in reality mild, transient episodes of mental instability and are frequently the starting points of impaired mental stamina whose effects may not come to the surface until later in life under stress of some sort, in the shape of a sharp mental breakdown. It is of importance, therefore, to bear such a possibility in mind in order that the future lives of such individuals may be judiciously ordered and any return of nervous symptoms be promptly met.

Insufficient sleep in the young calls for precautionary measures in the way of less study and more food, fresh air and exercise. Decided loss of flesh with or without any especial mental change should put us on our guard against mental or nervous breakdown in the predisposed and the delicate. Such loss of flesh is not confined to physical disease alone, as is usually supposed. Parents are apt to regard too lightly such indications, and the boy or girl concerned rarely admits mental or bodily tire, in fact does not feel it in most cases, as anaesthesia (absence of physical sensation) of fatigue is not uncommon under these conditions. The adolescent in school or college should be sent home and looked out for without temporizing whenever signs of insomnia, loss of appetite or decided lack of his usual energy and interest in work or sport become evident.

Overstrain in physical effort calls for especial precaution and, while mental and bodily cod-

ding should be discouraged, it should be borne in mind that nervous children become readily exhausted in both directions, and should be guarded so far as possible against pushing exertion to the point of daily fatigue. At the same time plenty of systematic open-air exercise, graduated to the individual's strength, should be encouraged. I have alluded to the necessity for restraint of the mentally precocious boy or girl. The physically precocious also come in for a word of caution. I refer to the very tall, thin, overgrown youths with this mental makeup. If such subjects always could be kept from physical over-exertion and athletic competitions, there would be fewer mental breakdowns.

Over-study is too often singled out as the cause of mental breakdowns; whereas the combination with it of other factors, such as rivalry, the expectations of the student's family, overstimulation of his efforts by the parents, strained circumstances and other sources of anxiety, as well as unhygienic living, is really responsible for the result. Nevertheless, there are not a few nervous children and adolescents, particularly the dull and backward, for whom much mental application is harmful. These subjects should not be forced, and the time spent in study by any boy or girl should never exceed five hours a day, with intervals for rest and exercise. It has been shown that children who study longer than this suffer more illness than those who understudy, and this is more noticeable the younger the scholar, as there is less resisting power.

For shy, sensitive, self-conscious, perhaps over-mothered boys or girls in good circumstances, the routine and associations of a well-selected preparatory school at a distance from home, where the right moral tone, discipline, physical training and an out-of-door life are important features of the school methods, and where they will realize that each of them is but one of many pupils, is an excellent corrective and upbuilder of mental and bodily strength and character. For the more highly nervous this occasionally proves too severe an experience, but it never need be disastrous, and it often happens that the doting and indiscreet parent gives it an insufficient trial. It is generally admitted, according to Stanley Hall, that girls in good boarding schools where evenings, food and regimen are controlled, are in better health than day pupils with social, church and domestic duties and perhaps worries, to which boys are less subject.

Social service work, both professional and amateur, should only be undertaken by the strong and vigorous girl. It calls for constant effort of the most taxing kind, and the anxious-minded, over-conscientious, delicate and determined worker is more than likely to suffer physically and nervously under the strain, besides exposing herself to the danger of mental breakdown. On the other hand, the high pressure of social gaiety when a girl is "coming out" is



only well withstood by the normal, healthy and vigorous girl, and even she is usually pulled down in flesh and spirit when the festivities are over. Late hours, loss of sleep, insufficient nourishment and a feverish unrest are accompaniments of this season, and occasionally have been the precipitating cause of nervous breakdown in the delicate. At all times the cultivation of healthy commonplace activities is the most beneficial course.

Effort at the prevention of mental disease among the poor must perforce be largely confined to the dissemination of simple instruction in mental hygiene through popular lectures, and especially the oversight given to convalescent and presumably recovered sufferers from dementia precox on their discharge from the hospital, through after-care and social service channels. By following up these cases, regulating their home lives and family surroundings, helping them to secure suitable employment and, in general, improving the condition under which the original breakdown occurred, it is sometimes possible to ward off, or at least, delay relapses. For this class this is among the most promising means of prevention. I must in this connection again urge the advantages of psychopathic hospitals with out-patient and social service departments for meeting the disease in the early stages. Nowhere else can the incipient cases among the poor be reached and treated with better prospects of success.

After-care applies with much greater force to cases of dementia precox occurring in the well-to-do for, when once an attack has been experienced, the dread of a relapse causes the more sensible and intelligent to listen to medical advice. They recognize more readily their limitations, and their relatives and their means enable them to escape the sources of fatigue and anxiety to which the poor are subjected.

## Massachusetts Medical Society.

PAPERS READ AT THE ANNUAL MEETING OF THE MASSACHUSETTS MEDICAL SOCIETY, WEDNESDAY MORNING, JUNE 7, 1916.

### THE COMMUNICABLE DISEASES OF CHILDHOOD.

#### I.

THE RELATION OF THE STATE DEPARTMENT OF HEALTH TO THE COMMUNICABLE DISEASES OF CHILDHOOD.

By ALLAN J. McLAUGHLIN, M.D., Boston.

MODERN health departments have expanded far beyond the field of communicable diseases

and now contemplate in the scope of their work all defects and deviations from the normal, whether due to germs or to other causes.

Teaching personal hygiene and attempting to keep people healthy does not mean that we intend to relax our efforts in the control of epidemic disease. We must hold what we have gained and try to go farther toward the elimination of communicable disease. The fact that typhoid fever has been reduced in Massachusetts to less than 8 deaths per 100,000, and that there are less than 275 deaths annually in Massachusetts from that disease, does not signify that we shall relax our control over water supplies and sewage disposal. Similarly, a continued effort with redoubled energy is necessary further to reduce the death rate for diphtheria, scarlet fever, measles and whooping cough.

In Massachusetts in 1914 the chief factors in our mortality were the following:

Infant mortality.....	9801
Pneumonia.....	5987
Organic heart disease.....	5128
Tuberculosis.....	5061
Cancer.....	3586
Bright's disease.....	3057
Apoplexy.....	2606
Syphilis.....	?
Diphtheria.....	652
Typhoid.....	268
Scarlet fever.....	246
Whooping cough.....	225
Measles.....	189
Influenza.....	129

Measles and whooping cough are much more serious than the figures indicate. A considerable proportion of deaths charged to pneumonia are really chargeable to measles and whooping cough. Important results have been secured in measles by research workers in regard to the period of infectivity and modes of transmission. Education of school teachers and parents in the early signs of this disease promises much in reducing measles still further. We are peculiarly fortunate in having recognized experts like Dr. Place and Dr. Morse discuss these two interesting factors in our death rate.

Our knowledge of scarlet fever has been augmented in the past year by the brilliant researches of Mallory, and the committee is to be congratulated in securing from Dr. Mallory himself a paper upon this subject. Scarlet fever will also be discussed by one of the foremost sanitarians in the United States, Dr. Charles V. Chapin, who, from long experience and ripe judgment, will give us valuable suggestions for the suppression of this disease.

In spite of the enormous reduction in diphtheria during the past two decades, I am not satisfied with the results at present. Considering the high standard of Massachusetts physicians, the free facilities for laboratory diagnosis, the free distribution of antitoxin and material for the Schick test, it is hard to understand that we have over 600 deaths a year from this easily preventable disease. The State Department of Health made an investigation of all



deaths from diphtheria in the past year, hoping to collect data which would show wherein the fault lies.

Is antitoxin given early enough? Is it given in sufficient doses? I am inclined to think that the physicians are not at fault in the bulk of the cases. Our investigation is not complete, but tends to show that in a majority of cases which prove fatal, the doctor is not called until too late.

It is a great privilege to hear an expression of opinion based on vast experience from Dr. Park of New York City, and it will be interesting to hear Dr. Hitchcock discuss diphtheria from the point of view of a district health officer of Massachusetts.

I desire to express my appreciation to the Society for the privilege of opening the session on the subject of the communicable diseases of childhood. I look upon it as an opportunity for improving the efficiency of our work in the state by applying the valuable suggestions which we will receive from the scholarly papers of Dr. Place, Dr. Mallory, Dr. Chapin, Dr. Park, Dr. Morse and Dr. Hitchcock.

## II.

### MEASLES AND THE PUBLIC HEALTH.

BY EDWIN H. PLACE, M.D., BOSTON.

#### OUTLINE.

#### I. Mortality.

- A. American cities—low.
- B. English cities—Liverpool, Glasgow, London.  
Liverpool chart. Measles greater than scarlet fever and diphtheria.
- C. Fluctuation in incidence.  
Boston chart.  
1. Causes: Exhaustion of material, etc.
- D. Fluctuation in mortality.  
Liverpool chart.
- E. Boston mortality.  
Contrast with scarlet fever.
- F. Errors in records.  
1. Cases not seen and reported, 10%?  
2. Confusion in diagnosis—toxic rashes and rubella.  
a. Histories of second attacks, etc.  
b. Rubella: distinct disease.  
(1) Diagnosis.  
(a) Incubation.  
(b) Invasion stage.  
(c) Eruption.  
(d) Lymph nodes.  
(e) Koplik spots.  
(f) Severity.  
(g) Immunity.

#### II. Methods of control— isolation, reporting, disinfection and quarantine.

##### A. Isolation.

1. Failure; few escape.  
a. Susceptibility.  
b. Contagiousness early.  
c. Koplik spots.  
(1) Appearance.  
(2) Differentiation.  
Bubbles.  
Food.  
Detritus.  
Thrush.  
Stomatitis.  
Trauma.
- (3) Location.
- (4) Time and duration.

##### B. Disinfection.

1. Early death of virus.
2. Communication to others direct.

##### C. Quarantine.

1. Value.
2. School.

##### D. Results. Postponing of disease.

#### III. Manner of spread.

- A. Period of contagion, carriers, desquamation, late discharges.
- B. Direct contact.
- C. Droplets.
- D. Locus of virus—nose, throat and blood. Animals.
- E. Point of entry.
- F. Characteristics of contagiousness.

#### IV. Measures of management. Importance.

- A. Mortality—due to broncho-pneumonia.
- B. Prevention of pneumonia.  
1. Sunshine, fresh air, free fluids, rest in bed, regulated diet.  
2. Conditions actually found.  
3. Fear of eyes.  
4. Heat treatment.  
5. Draughts.  
6. Local resistance.  
a. Mouth and nose.  
b. Larynx and trachea.
7. Protection from infection.
- C. Limit of influence of these measures.  
1. General condition and nutrition.  
2. Other diseases.
- D. Conclusion.

In American cities, the mortality of measles is relatively low and but little attention is directed to it.

In English cities, on the other hand, as Liverpool, Glasgow and London, and in Paris and Petrograd, the measles mortality has been very high for years.

In Liverpool measles is a more important factor in the death rate than scarlet fever and diphtheria combined. (Chart 1.)



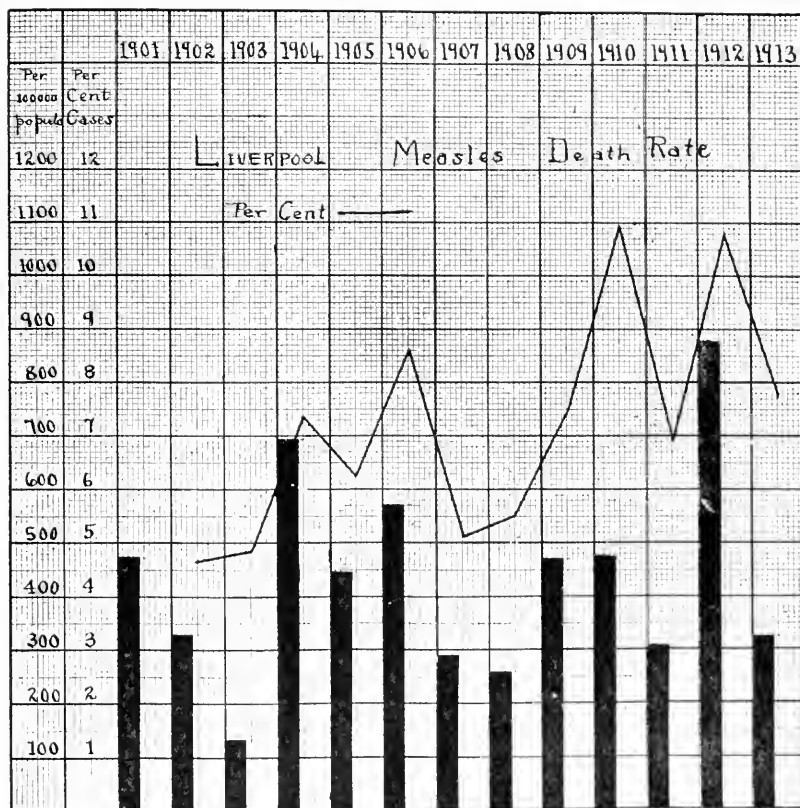


CHART I.

There is a marked fluctuation in the occurrence of measles as shown, for example, by Chart II of measles incidence in Boston.

This fluctuation in incidence is apparently due to a variation in the number of susceptibles. After each epidemic year in a community there follow from one to four, usually one to two, years of low incidence, until a sufficient number of susceptible children have grown up to supply fuel to the spark of contagion.

There is a corresponding fluctuation in the case fatality rate, extensive epidemics being usually associated with a more fatal form of the disease. This is shown in the records of Liverpool, as seen in Chart I. A rise in the total deaths and cases is accompanied, as a rule, by a rise in the case fatality rate.

In Boston the mortality rates, both case fatality and for every 10,000 of the living, have shown no definite downward trend during recent years. This is shown in Charts I, III and IV.

Charts III and IV show Boston's measles and scarlet fever mortality contrasted.

As compared with scarlet fever, it is seen that, for the last ten years, measles has been a greater cause of death than scarlet fever. This is not due to an increase in measles fatality but to a decrease in scarlet fever death rate.

Many errors occur in the records of measles which make figures open to some doubt.

First, many cases of measles are not seen by a physician and are not reported to the health department. This is especially true of mild attacks and of secondary cases in a family. In my histories, which show measles as having occurred previously, nearly 10% were not seen and diagnosed by a physician.

Second, confusion in diagnosis with toxic rashes and rubella, or German measles, is very common. Histories of second and third attacks, and even fourth and fifth attacks, are fairly common, while real second attacks are ex-



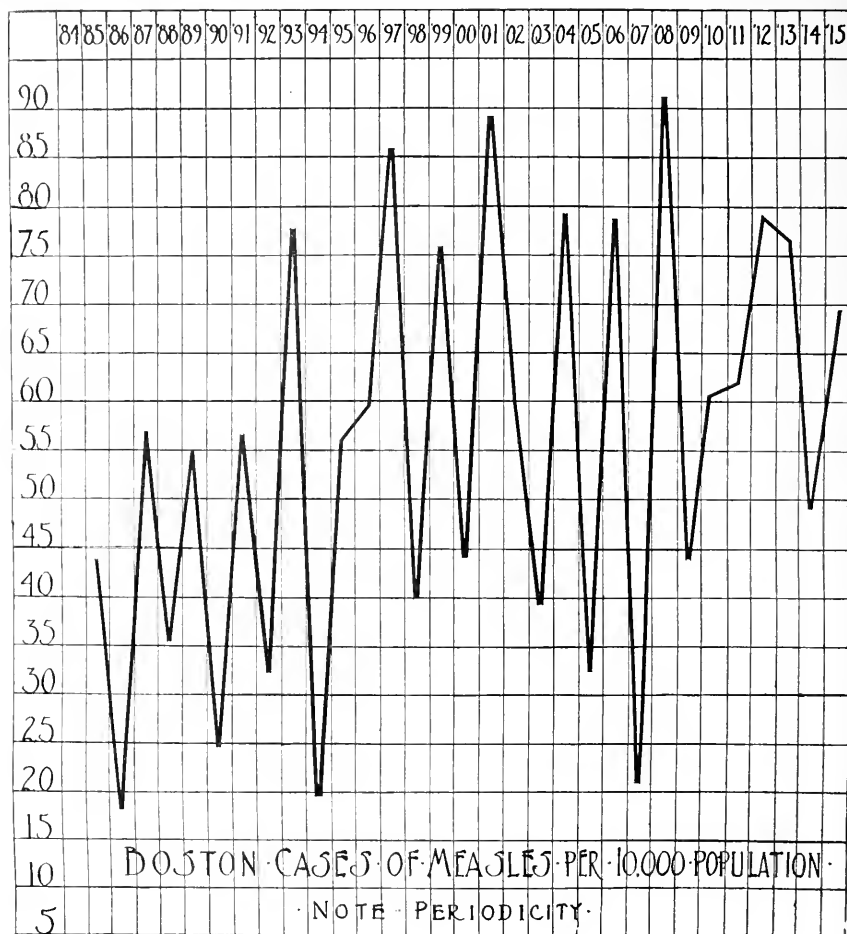


CHART II.

sively rare. I have not seen a second attack which I could consider authentic.

Many physicians grant no distinction between measles and rubella, holding that they are forms of the same disease. Others make a false distinction by classing all mild attacks as rubella. Measles and rubella are distinct diseases, and although rubella is usually a much milder disease, some attacks are more severe than mild measles.

Rubella differs from measles as follows:

1. The incubation period is longer, being 14 to 21 days, averaging 17.
2. The period of invasion, or the prodromal

stage, is absent or short, usually being less than one day.

3. The eruption is smaller, more rounded, and more uniform, the spots averaging about 2-3 mm. in diameter. The eruption appears in the same places and order as measles but spreads downward and evolves much faster. The height of the eruption is usually reached on the first or second day and fading is complete by the end of the third day. No pigmentation follows.

4. There is more striking enlargement of the superficial lymph nodes, especially the post-auricular and post-cervicals, although usually all show enlargement. In rubella about 90% show



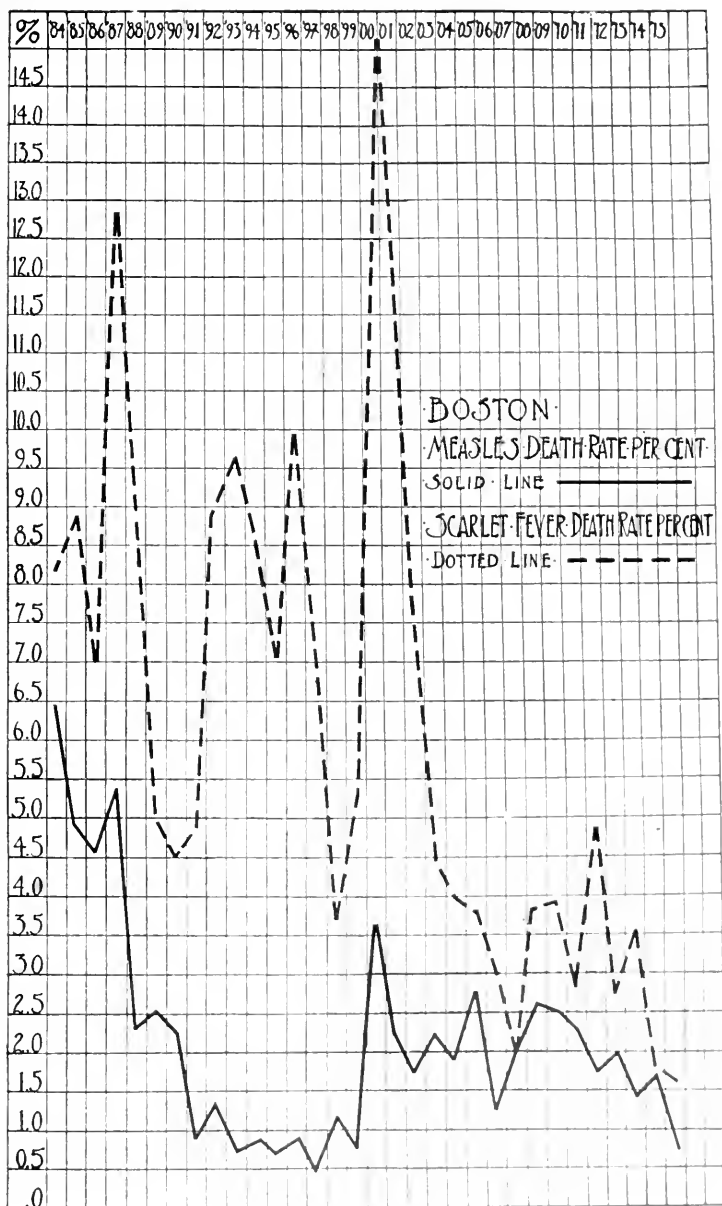


CHART III.



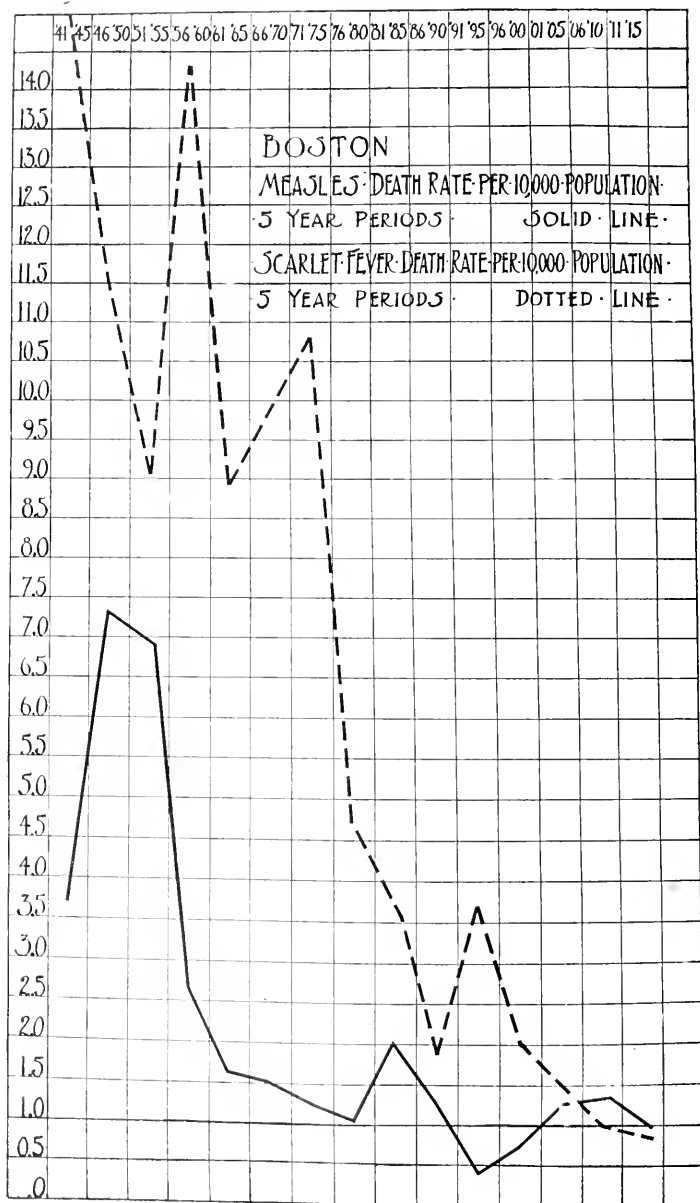


CHART IV.



post-auricular enlargement to less than 10% in measles.

5. No Koplik spots occur. Early in the course of rubella are often seen small maculopapules on the buccal mucous membranes and soft palate, but there are no granular specks such as distinguish Koplik spots.

6. Rubella is milder and has no complications.

So great is the variation in all these factors in both, however, that differentiation is sometimes excessively difficult and may be impossible. For proof, it may be necessary to depend on immunity evidence. Rubella confers no immunity to measles, and vice versa.

The methods of control which have been in use are isolation, with compulsory reporting, disinfection and quarantine especially as related to the schools.

The results obtained by these methods are practically nothing. There is no evidence that the incidence has been decreased, and there is no more probability of a child reaching adult life without contracting the disease now than generations ago. Very few escape except in very scantily settled communities whose communication with the world is slight. When the disease is introduced in such communities, such as the Faroe Islands, the epidemics are extensive and involve all ages. Most of the immunity in adult life is acquired.

There are several reasons for this failure in measles control. First, there is almost universal susceptibility. My records show that about 90% of young adults have had measles, the remaining 10% being chiefly persons who have forgotten or who have had unrecognized attacks, especially in infancy. Panum found no natural immunity in the Faroe Island epidemic he studied.

Second, measles is highly contagious for several days before the rash and before recognition, even in cases developing in general hospitals. No restrictions are placed, therefore, upon the patients during about half the contagious period. This first half is not only more contagious by far, but the patient does not feel sufficiently ill usually to give up his routine and freely exposes others. Isolation is, therefore, little effective even if many cases did not escape recognition altogether.

Even when diagnosis is made early by means of Koplik spots, communication of the disease to others in contact has usually occurred. Koplik spots, however, are of great value. Recently a nurse on duty in the diphtheria ward reported in the morning with catarrhal symptoms. She had Koplik spots and was isolated. Although the previous day she had been in contact with over 60 patients, many of whom had no history of having had measles, no cases developed. The nurse had a severe attack.

If isolation is to be of value at all, in measles control, it will require the general recognition

of the disease in the catarrhal stage by means of Koplik spots.

In order to see these spots it is essential to have a good light, preferably daylight, and to turn the mucous membrane of the cheek so that the light will reflect from it to the eye. When they are coalescent, the mucous membrane is covered with minute, pin-point, whitish, bluish white or nearly colorless granules, that do not wipe off. When discrete, they stand out more noticeably as whitish specks something like curdled milk, pinhead, or even larger, in size, and with a roseola. They may be few or countless. The appearance is often as though the buccal membrane had been dusted over with very fine white sugar or sand.

Koplik spots must be differentiated from bubbles, food deposits, and detritus, which easily wipe off, and from thrush, other stomatitis, thickening of the mucosa as plaques, and trauma from catching the mucous membrane slightly between the teeth or to rough teeth or tooth-roots. They are best seen on the buccal mucous membrane, but are also found on the palate, pillars, tonsils and nasal mucosa and possibly in the conjunctiva. They occur from one to six days before the rash, usually two to three, fading after two to three days as the rash becomes pronounced. They may fade before the rash appears or appear only as the rash comes out. I have never seen them absent in a true measles case seen throughout the disease, and believe they are as constant as the rash, i.e., practically 100%.

Disinfection is without value in public health work. The virus dies so rapidly, that disinfection adds practically nothing to safety. Beside, the patient has usually already communicated the disease directly to all those likely to come in contact with his surroundings. I have never found evidence clinically of the virus surviving over six hours outside the body, and it usually dies much sooner. If persons who have not been exposed are to be brought in contact with material infected within less than six hours, disinfection may be of value but not otherwise.

Quarantine is of value if it can be applied thoroughly. In fact, it is our only recourse in the management of measles epidemics that is of value. Shut up the contacts or divide them up into small units until the disease burns out.

Schools play no small part in the dissemination of the disease and an epidemic in a school cannot be stopped, as a rule, while the school remains open, until it has exhausted the material. This is in contrast to scarlet fever and diphtheria.

There are many other manners of contact however, and closure of the school, unless home restrictions can be applied, is of very doubtful influence on the prevalence of the disease. To be effective, closure of the school must continue until no susceptible exposed children will return. In Liverpool, where school closure is a common



practice and thought to be of value, the general incidence and mortality does not seem to be altered.

The most that can be expected of these measures is to postpone the disease to a slightly later period of life. Even this is of value as the mortality is much greater, the younger the patient. Barthéz and Sannée gave the following death rates by age:

	PER MILE
1 year.....	92.
2 " .....	53.1
3 " .....	34.4
4 " .....	30.3
5 " .....	24.9
6 " .....	17.5
7-15 years.....	9.6

Liverpool's rate for 1913 shows a similar variation.

The period of contagion is very short, less than two weeks and rarely over seven days. No carriers occur and the desquamation and discharges from nose and ear, etc., after the acute stage, are not contagious, although this is not generally appreciated. Measles is spread chiefly by direct contact and by droplet infection. Recently infected objects such as hands, handkerchiefs, dishes, etc., may spread the disease, but only for a few hours. Measles occurs spontaneously only in human beings and has no natural habitat outside human bodies. Domestic animals are not known to have measles. The virus is present in the blood during the early invasion stage, and just before, as shown by Hektoen and by Anderson and Goldberger. It leaves the body for transmission to others chiefly or solely in the discharges from the nose and throat, and possibly eye. Its point of entry is also the nose and throat.

As measles produces no carriers, it depends for its continuance on the ready transmission by discharges from nose and throat from person to person and on the high susceptibility to the disease. These characteristics explain the great fluctuation in the incidence, the periodic waves that sweep through communities.

With so little evidence of control of the disease and so slight hope under actual living conditions of really restricting the disease, what may be suggested as an outlet for our efforts against measles?

The mortality of measles is essentially the result of *bronchopneumonia*. Enteritis, mastoiditis, meningitis and septicemia, as well as sequelae such as tuberculosis, are occasional causes of death, but fully 90% of the deaths are due to pneumonia.

Chart v shows the percentage fatality of measles in Boston for the last five years arranged by wards. While no ward has solely good or solely bad hygienic conditions, it is evident that those sections of the city in which hygiene in the home is less good have the highest mortality. In contrast to this the diphtheria fatality for the same period shows no such suggestive relationship to general hygiene. The death rate of diphtheria is due largely to specific toxemia, and while greatly increased by ignorance and carelessness, it is not especially affected by hygiene *per se*. (Chart vi.)

Measures of management should thus be based on prevention and treatment of pneumonia, such as securing sunshine, fresh air, free fluids, rest in bed, regulated but sufficient diet, etc.

As a fact, on the contrary, the usual treatment, founded on custom and superstition, consists of dark rooms, stuffy atmosphere, many

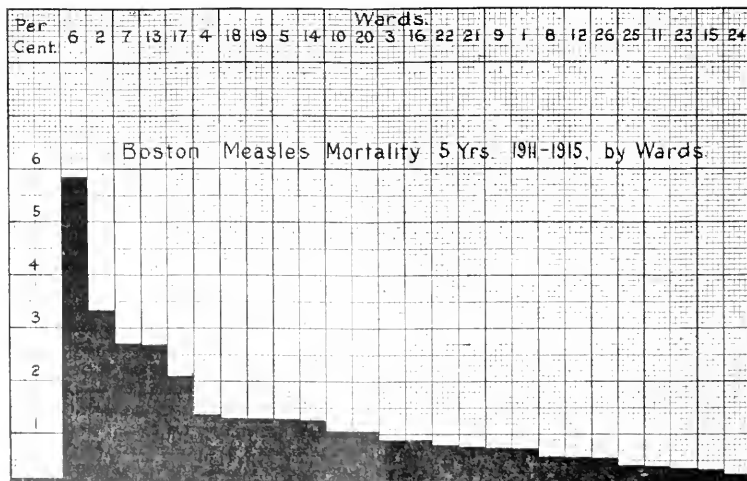


CHART V.



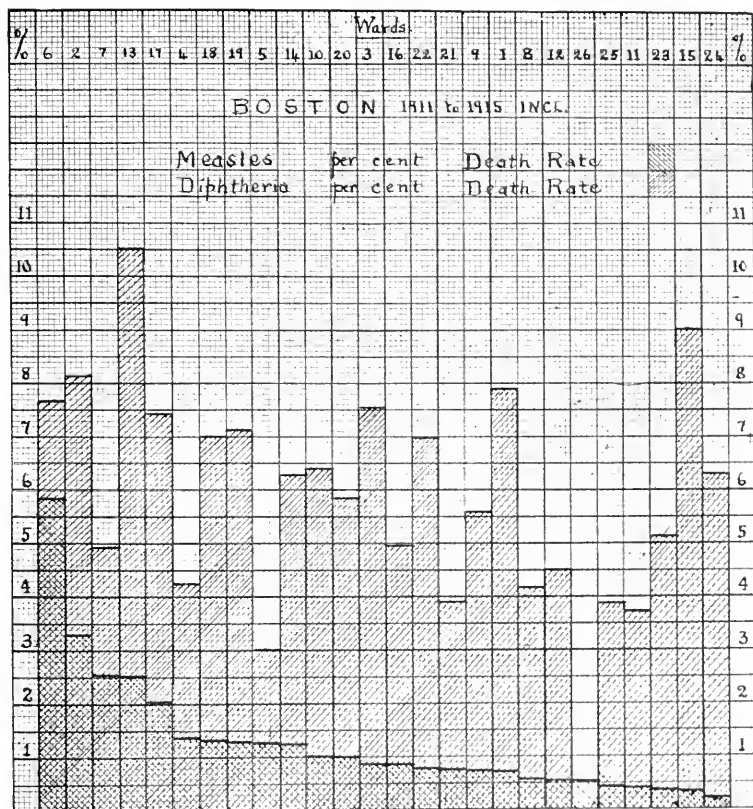


CHART VI.

blankets and hot drinks—all factors to reduce resistance and vasomotor tone.

The fear of the eyes which, for generations, has been emphasized by layman and physician alike, should be eradicated with the other superstitions. The only real danger of eye trouble is corneal ulcer which is fostered by uncleanness, trauma and poor hygiene, and the most valuable treatment is cleanliness and hygiene. As von Jurgenson says, we should not wait for the oculist to tell us of the value of light and hygiene. Photophobia is often absent and, when present, may be controlled by shading the eyes or with goggles while the patient has the advantage of fresh air and sunshine in his room.

The heat treatment and sweating for the purpose of keeping out the rash is a relic of barbarism and the result of false reasoning. It should have disappeared with universal blood-letting and purging.

The much dreaded "striking in" of the rash is not seen in patients treated under modern

hygienic conditions. Of course the rash does not "strike in." Simply the blood to the skin is withdrawn to the splanchnic area due to vasomotor paralysis, and the resulting blanching of the skin causes the rash to fade. The heat treatment, while of value at times in the presence of such shock, is of no value in forestalling it in these toxic states. In fact it is likely to reduce vasomotor tone.

Fresh air and draughts are sedulously avoided. In my opinion draughts do no harm, although chilling the patient so that the extremities become and remain cold is harmful whether from a draught or not. So long as patients are warm and comfortable, the out door treatment is the best for measles.

Beside these attentions directed toward general resistance the local resistance of the mucous membranes should be favored. Cleansing of the mouth, the use of oily protective sprays, plain or with camphor and thymol and eucalyptol for the nose if obstructed, and the free intake of



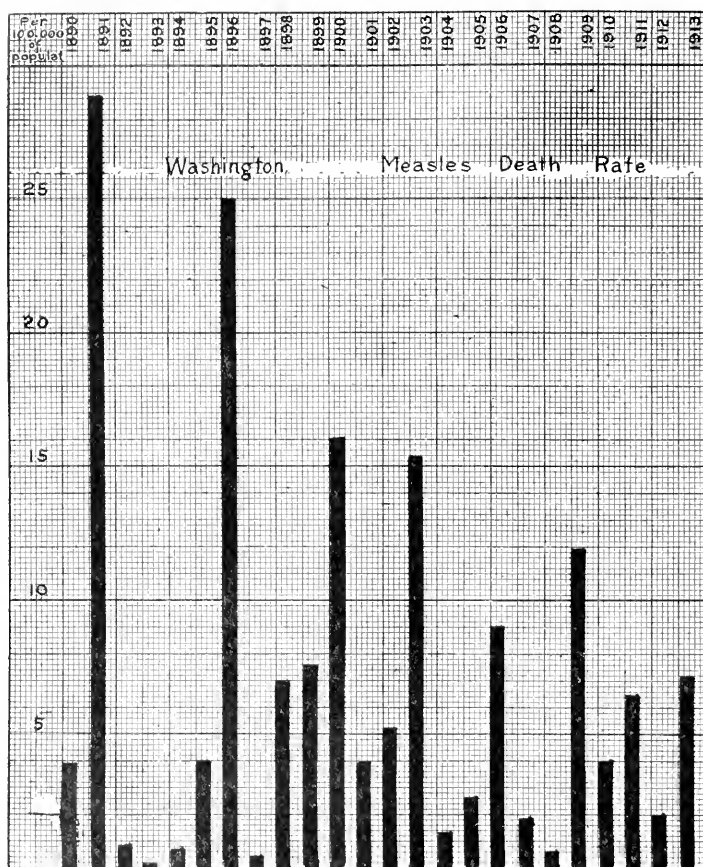


CHART VII.

water, may all have some bearing on mucous membrane infection. It is doubtful if inhalations of any kind are of great value in the local resistance of the mucous membrane of the lungs, but they may be of value for infections of the larynx and trachea. Relief from the harrowing cough is essential, and expectorants (of which water is the essential) and codeine are often necessary to favor sleep and avoid local trauma from constant coughing.

Protection of measles patients from other infections like the common colds and diphtheria is especially important. It is probable that the organisms producing pneumonia are usually present on the mucosa in measles and are not imported from other patients who are already ill with pulmonary complications. E. W. Goodall reported that of 220 consecutive cases of measles admitted to the Eastern Hospital, Lon-

don, 19.5% had pneumonia on admission; while of 177 cases admitted, without complications, only 6.3% developed pneumonia. I have failed also to find any definite connection between the cases developing pneumonia after admission and cases which already had pulmonary infection. It is worth while, however, avoiding even the risk.

These measures will not eradicate, of course, the death rate of measles or pneumonia. The general condition of the patient, his vitality and nutrition, as well as absence or presence of other diseases, are important factors in the mortality when measles develops. In good homes and in healthy children in good hygienic surroundings the mortality is very low; while in weak and ill children it is very high.

Comby gives the following figures for hospital and asylum cases:



## Hospice des Enfants Assistés:

5 years 1575 cases 728 deaths 46.22%

## Hôpital des Enfants Malades:

7 years 2585 cases 1045 deaths 40.15%

## Hôpital Trousseau:

5 years 907 cases 227 deaths 25.02%

In contrast to this are the figures of the Newton Board of Health.

## NEWTON.

Year.	Cases.	Deaths.	Per Cent.
1908.....	489	0	0.00
1909.....	428	3	0.70
1910.....	236	0	0.00
1911.....	368	4	1.08
1912.....	774	0	0.00
1913.....	280	0	0.00
1914.....	388	1	0.25
1915.....	203	1	0.34

## MEASLES CASES AND DEATHS AND PER CENT. OF CASE

## FATALITY, BOSTON.

## ARRANGED BY WARDS.

Ward.	Cases.	Deaths.	%	Ward.	Cases.	Deaths.	%
1	830	6	0.72	14	933	12	1.28
2	1116	37	3.31	15	591	2	0.33
3	448	4	0.89	16	779	7	0.89
4	436	6	1.37	17	764	16	2.09
5	233	3	1.29	18	684	9	1.31
6	1743	102	5.85	19	920	12	1.30
7	545	14	2.57	20	2488	26	1.04
8	1563	9	0.57	21	1014	8	0.78
9	1062	8	0.75	22	1004	8	0.79
10	573	6	1.05	23	868	3	0.34
11	738	3	0.40	24	1761	4	0.22
12	884	5	0.56	25	1190	5	0.42
13	662	17	2.56	26	358	2	0.56

## DIPHTHERIA CASES AND DEATHS, BOSTON, 1911 TO 1915

## INCLUSIVE.

## ARRANGED BY WARDS.

Ward.	Cases.	Deaths.	%	Ward.	Cases.	Deaths.	%
1	519	41	7.90	14	316	20	6.32
2	675	55	8.14	15	344	22	9.01
3	226	17	7.52	16	383	19	4.96
4	187	8	4.27	17	456	34	7.45
5	198	6	3.03	18	290	21	7.02
6	1005	77	7.66	19	558	40	7.16
7	161	8	4.96	20	922	54	5.85
8	884	37	4.18	21	485	19	3.91
9	321	18	5.60	22	415	29	6.99
10	156	10	6.41	23	390	20	5.13
11	215	8	3.72	24	467	22	6.39
12	485	22	4.53	25	335	13	3.88
13	342	36	10.52				

## LIVERPOOL.

## DEATH RATE OF MEASLES.

Year.	Per 100,000 Population.	Per 1000 Cases.
1901.....	472	.....
1902.....	330	4.67
1903.....	132	4.84
1904.....	693	7.36
1905.....	245	6.27
1906.....	579	8.59
1907.....	290	5.15
1908.....	258	5.56
1909.....	470	7.41
1910.....	472	9.96
1911.....	308	6.92
1912.....	875	10.85
1913.....	322	7.72

I believe that a definite decrease in mortality may be secured by the application more generally of the principles of hygiene to patients who become ill with measles. Occurring in each generation, the disease is especially subject to the handing down of home ideas of treatment. It is for the medical profession to substitute for the irrational and often harmful ideas of management a sensible, rational and scientific handling of measles.

## III.

## THE ETIOLOGY OF SCARLET FEVER.

BY F. B. MALLORY, M.D., BOSTON.

THE primary lesion of scarlet fever is located in the respiratory tract, starting usually in or around the tonsils. In severe cases it may extend to the naso-pharynx, to the larynx, trachea and bronchi, or to the esophagus. The lesion consists of necrosis and inflammation. It may affect only the surface epithelium, but often invades also the underlying tissues. The exudation consists of serum and polymorphonuclear leucocytes. Fibrin may be absent or formed in moderate amount. The lesions may appear from the beginning as erosions or as membrane-formations. In the pharynx erosions are often visible even in mild cases. In severe infections membrane formation may occur in the larynx, trachea, and bronchi, but it is rarely or never so dense or adherent as in diphtheria.

Study of the lesions of scarlet fever shows the presence in them of a delicate gram-positive bacillus in large numbers. A brief statement of what Dr. E. M. Medlar and I have found up to the present time is appended; also three plates of illustrations. The subject was presented to the Society in the form of a lantern-slide demonstration, but a connected account of our findings seems more proper for publication.

Microscopic examination of the tissues from a child dying from scarlet fever on the second day following the appearance of the skin eruption shows large and small masses of gram-positive bacilli in some of the crypts of the tonsils. The bacilli lie in the upper portion of the fibrino-purulent exudation covering the walls of the crypts, from which the lining epithelium has disappeared. Streptococci are fairly numerous all through the exudation, occasionally in the underlying tissues, and also abundantly in the free pus present in the lumina of the crypts.

Clumps of similar bacilli occur in the exudation on the surface of the tonsils. In addition, masses of these bacilli are present in practically pure culture in slight depressions and erosions in the squamous epithelium covering the tonsils, the pillars of the fauces, the soft palate, includ-



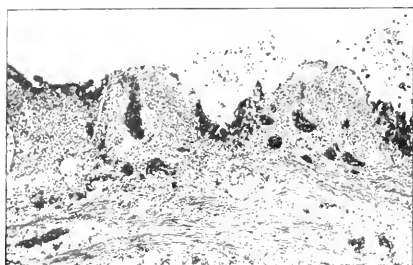


PLATE I. FIG. 1.—Trachea (10,20); moderate membrane formation with masses of bacilli in the upper portion of it. X200.

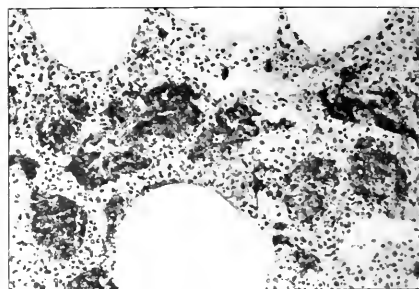


FIG. 4.—Lung (10,20); masses of bacilli in alveolar spaces; exudation of serum, polymorphonuclear leucocytes, and a little fibrin. X200.

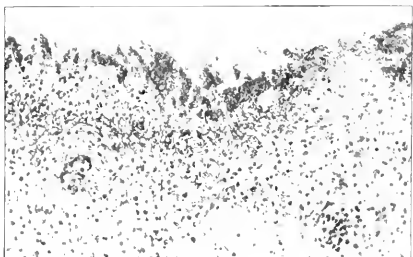


FIG. 2.—Pharynx (05,109); masses of bacilli on surface of lesion. X200.

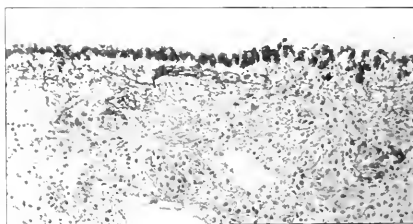


PLATE III. FIG. 5.—LARVIX (05,109); masses of bacilli along the surface of a thin membrane. X200.

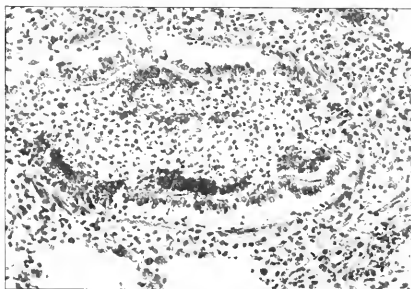


PLATE II. FIG. 3.—Bronchiole (10,20); clumps of bacilli along epithelial surface; exudation of serum and polymorphonuclear leucocytes. X200.

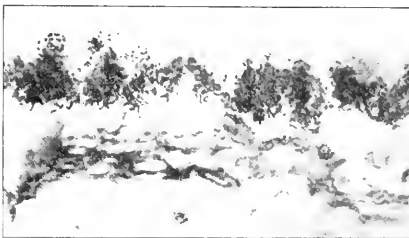


FIG. 6.—Same as Fig. 5. X1000.

ing the uvula, and the root of the tongue. The bacilli grow in between the epithelial cells, killing them and causing an exudation of polymorphonuclear leucocytes. Little or no fibrin is found.

In the trachea the epithelium has disappeared. The surface in places is covered with a thin layer of fibrin and leucocytes. Along the surface and in the upper part of this exudation are masses of bacilli similar to those present in the epithelial covering of the soft palate. Where the exudation has been detached from the wall,

the bare basement membrane shows the same bacilli scattered along it in small numbers.

In the lung is a well-marked broncho-pneumonia due to masses of bacilli like those in the trachea, and occurring apparently in pure culture. Some of the bronchioles and alveoli are completely filled with the organisms. The inflammatory exudation consists almost entirely of serum and polymorphonuclear leucocytes. But little fibrin has been formed.

In a second early case the tonsils show considerable necrosis and ulceration. In the exudation are many streptococci. Along the surface of the exudation in the crypts are small masses of organisms which stain irregularly and are evidently disintegrating. Their exact structure cannot be determined. On the surface of



the pharynx and larynx are lesions similar to those in the first case, but more extensive. In places the organisms form a continuous layer. More fibrin is present in the exudation, and occasional clumps of cocci are found.

Smears made from swabs thrust deeply into the crypts of the tonsils in three early cases of scarlet fever (from ten to forty-eight hours after the appearance of the eruption) showed small and occasionally large masses of gram-positive bacilli similar to those described above in the lesions found at post-mortem examination. In two patients without tonsils, smears made from the pillars of the fauces and from the soft palate showed similar bacilli in small clumps. Curettings of erosions on the soft palate of one of these patients showed masses of the same bacilli. In smears made only from the surface of the tonsils of two cases the findings are doubtful.

Cultures of a bacillus resembling morphologically and in staining reactions that found in the post-mortem tissues, and in the smears from the tonsils and soft palate, have been obtained in five instances, four times from the crypts of the tonsils and once, when the tonsils were absent, from the soft palate.

The organism is a strongly gram-positive bacillus (decidedly more so than the diphtheria bacillus). It stains well with ordinary dyes and shows a tendency to irregularity of staining in lightly stained preparations. This irregularity of stain is also noted in too strongly decolorized gram preparations. No polar bodies are present.

In culture the bacillus is slightly smaller than the diphtheria bacillus, and varies from coccus-like to large bacillary forms. The average-sized bacillus is 1 to 3 micra in length by .5 to .7 micron in diameter. It is broadest in the middle and tapers slightly toward the ends, which are rounded. Ordinarily in smears from growth on solid media the bacilli are in masses arranged similarly to diphtheria bacilli. Pairs and short chains of bacilli are common, while occasionally, and more constantly in the water of condensation, long chains are found.

The bacilli in tissues and in direct smears from scarlet fever cases are slightly larger than the organisms in culture, but otherwise resemble them. In some instances there is a greater tendency toward irregularity of stain than in cultures.

The organisms isolated are facultative aerobes. They grow best anaerobically upon serum-glycerin (3%) dextrose (5%) agar. Less abundant growth upon other media occurs.

The colonies attain the size of .5 to 1 millimeter in diameter in twenty-four hours at 37° C., and after that do not greatly enlarge. By direct illumination they are opalescent with an opaque refractive center more noticeable in the larger and older colonies. Upon micro-

scopic examination they are finely granular. Their edge is entire or slightly undulate.

It seems reasonable to infer from these observations that scarlet fever may be due to a strongly gram-positive bacillus (*B. scarlatinae*) which is less virulent than the diphtheria bacillus, but which infects practically the same localities, and in severe cases may extend in the same way to adjoining tissues, especially the larynx, trachea, and lungs. The toxin causes necrosis and desquamation of the covering epithelium and leads to an exudation of serum and polymorphonuclear leucocytes. Fibrin formation is usually absent or slight. On this account the primary gross lesions are inconspicuous and easily overlooked. There is usually little membrane formation to call attention, as in diphtheria, to the lesions.

The bacillus of scarlet fever usually dies out quickly in the lesions, so that after the second or third day following the eruption, it is often difficult or impossible to demonstrate it, but it opens the way for streptococcus invasion and seems to favor its growth.

#### IV.

#### SCARLET FEVER.\*

By CHARLES V. CHAPIN, M.D., PROVIDENCE, R. I.

THE attempt to control an infectious disease may do two things. It may reduce the incidence of the disease, as has been so signally accomplished in yellow fever, typhoid fever and malaria; or it may reduce the case fatality, as has been done by the use of sera in diphtheria and cerebrospinal meningitis.

Although there is at times much difficulty in interpreting vital statistics, yet it is necessary to make an ultimate appeal to statistics to determine whether measures of control are effective. The mortality figures for scarlet fever are most encouraging. Thus in Boston the mortality from this disease in the five years 1855-59 was 142 per 100,000 living, while in the five years 1906-1910 it was only 9. In Providence it fell from 124 in the decade 1856-1865 to 15 in the decade 1906-15. A similar reduction is noted in many other American and European cities, particularly in England. To what is it due? Unlike the reduction in diphtheria mortality, it is probably not due to better treatment. It may be due, wholly or in part, to a diminished virulence. It is well known that scarlet fever varies greatly in this respect. Has there been a change in Boston or Providence during the last sixty or seventy years sufficient to account for the lessened mortality? This is not easy to determine. During the thirty-two years during which there has been notification of cases in Providence, the apparent case fatality has varied considerably. It was decidedly high during the first few years, ranging from

\* Read at meeting.



about 10 to 22%. That this was, to a considerable extent, due to defective notification is almost certain, as was the high case fatality of typhoid fever and diphtheria at the same time. The memory of physicians over such long periods is not trustworthy. The only other criterion of virulence suggested is the index of plural deaths. The frequency with which more than one death occurs in a family ought to indicate the virulence of a disease. At considerable labor I had worked out the ratio of plural deaths in scarlet fever for a number of years, and found, where the case fatality was known to be high the number of plural deaths was high. Selecting ten years with an average case fatality of 2.62 the ratio of plural deaths was 5.3, while in ten years, with an average case fatality of 8.5, the ratio of plural deaths was 11.2. In 1906-7 a much more severe type of scarlet fever appeared, with a case fatality of 12%. The ratio of plural deaths to total deaths in these two years was 12. It would thus appear that the ratio of plural deaths is a rough indication of the severity of the disease. Turning now to the first decade of death registration, 1856-1865, it is found that the average ratio of plural deaths was about 9, or nearly twice as great as in the years when the case fatality was 2.6. It seems highly probable that half a century ago the disease was at least three or four times as virulent as at the present time, but as the deaths were from ten to fifteen times as numerous it is a fair inference that the disease is not only milder, but far less prevalent today than it was fifty years ago. This diminished prevalence is probably due in part to isolation and is partly because a severe type of the disease is apparently more infectious than a mild type. On the whole, it may be inferred that isolation has to a considerable extent diminished the incidence of the disease, but that a decreased virulence is also largely responsible for the greatly lowered death rate. Another indication of the effect of isolation is seen in the curve of scarlet fever mortality. In many cities, before isolation was enforced, the disease occurred in sharp outbreaks, four or five years apart, much as measles occur now, though at slightly longer intervals than measles. After notification and isolation the curve flattens out and the epidemic peaks are much lower, thus indicating a real control of the disease.

It is stated by English observers that the age of attack has been postponed, which is desirable in itself, as the fatality is far less after the second year, and also indicates that restrictive measures have really reduced the incidence of the disease.

I am also inclined to think that isolation has been an important factor in reducing the severity of the disease. If a disease tends at all to breed true, that is, if severe cases follow severe and mild follow mild, isolation, as generally

carried out, must lower the virulence. The severe cases are sure to be recognized and are isolated, so that they have less chance of perpetuating their strain than have the mild cases, which so often fail of recognition. Scarlet fever does breed true to some extent, for we find a mild type often prevailing for years in a locality. On the other hand, although the mild type quite generally prevails at the present time, more or less severe outbreaks occur. Thus in Providence for about four or five months in 1906-7 there was such an outbreak, with a case fatality of 16 or more. Similar outbreaks are from time to time noted elsewhere, and the type is carried from one community to another. At present these outbreaks are not very numerous, and they seem usually to be checked, as one would naturally expect that they would be. A similar phenomenon is noted in smallpox, a very mild type of which has persisted for about twenty years. The severe type has been introduced from abroad many times, but has always been stamped out, often very promptly. If this theory is correct, isolation accomplishes as much, and perhaps more, by decreasing the severity of the disease, as it does by decreasing its prevalence.

The great reduction in the mortality in Boston began in 1877, two years after systematic isolation was inaugurated, and in Providence in 1889, three years after isolation was inaugurated. So also the marked decrease in the number of deaths in English cities is, in a way, coincident with the application of methods of isolation. It is to be noted that, while there has been some irregular diminution in the death rate of late years, it has not been nearly as marked as it was at the beginning of public health activities against the disease. Thus in Providence during the last twenty years the rates for the five-year periods have been 9, 11, 21 and 9. In Boston they were 20, 15, 10 and 9. In all the registration cities of the United States the rate fell from 12.8 in the five years 1900-1905 to about 11.9 for the five years 1909-13. The retardation in the decrease has taken place in the face of a slowly-improving notification, better isolation and increasing hospitalization.

The most effective means of isolating a case of contagious disease is to put it in a hospital. This view induced the English to attempt to stamp out this disease, or reduce it to a minimum, by the hospitalization of as many cases as possible. This began to be urged thirty-five or forty years ago, when the high mortality of the disease was a serious menace. Many large hospitals were built, and in a number of cities the hospitalization of a large proportion of reported cases has been accomplished, but with very disappointing results. The disease is far from exterminated. There are more cases in London than in New York, more in Liverpool than in Boston, more in Leicester than in Provi-



dence, though hospitalization is far less complete in the American cities.

It thus appears that the control of scarlet fever by the usual methods of home isolation and hospitalization is disappointing. The disease is still very prevalent and, while decreasing, the decrease is not rapid. In England, where in many cities 90% of the cases are removed to a hospital, they are questioning the wisdom of such an expensive method of isolation, which has so little influence on the prevalence of the disease.

In this country health officers for the most part thoughtlessly follow routine methods of control and hope, by urging better reporting by physicians, and perhaps more stringent isolation, further to reduce the disease. It is generally agreed that the chief reason for the failure of isolation is the existence of so many missed cases and carriers. Many believe that the former are more common and much more important than the latter. It is alleged that to control the disease it is necessary for the health officer to go out and search for the mild cases, which either have not been seen by a physician, or have not been recognized by him. Dr. Hill, former epidemiologist of the Minnesota State Board of Health, and Dr. Chesley, his successor, have been most successful in developing this investigation of sources of infection. In a recent article, Dr. Chesley<sup>1</sup> has given an excellent description of the control of an outbreak in a town of some 5000 inhabitants, in which there had been many mild cases, which were generally believed by the physicians, as well as by the laity, to be German measles. Every child in school was carefully examined, all absentees looked up, all reported cases investigated, and all with whom they had been in contact during the period of incubation, sought for and examined. All susceptibles who had been in contact with the sick were kept under observation. The examination of all school children and of all who are sick at home, and the working out from every frank case which can be discovered, both to find missed sources, and to prevent danger of cases developing in contacts, are the essentials. Dr. Chesley does not favor too strict isolation of the cases and deprecates unnecessary hardships for well wage-earners as tending to encourage concealment. It is stated that many scores of outbreaks of scarlet fever in Minnesota have been cut short by these methods. Doubtless such an intensive search for missed cases is best suited to small communities, especially those with a homogeneous and English-speaking population. Doubtless, also, it is easier for some one with authority from outside, like a state health officer, to step in and take charge, than it is for the local health official to undertake such work. Nevertheless, there is no doubt that more intensive work of this kind in ferreting out sources of infection, especially

in the beginning of an outbreak and in small communities, would very materially reduce the prevalence of scarlet fever in such communities.

Even in the large cities probably something more might be done by a more diligent search for missed cases, but it can scarcely be hoped to lower materially the incidence of the disease in this way. Imagine how futile it would be, in a crowded Polish or Italian quarter of Boston or Providence, to attempt to find and follow up all the persons with whom a seven-year-old boy had come in contact during the preceding week. It is to be feared that the disease cannot materially be lowered in this way.

Though striking results may not be obtained in every community by isolation, yet, even ordinary routine methods of control have great value. By them the virulence of the disease is lowered, its prevalence is kept down and slowly diminished, and if abandoned there would probably soon be a reversion to conditions of fifty years ago. What we should strive for is the isolation of more cases, not more isolation of the cases. To determine the essentials of isolation, reference must be had to what is known about the mode of infection. This knowledge is considerable in view of the fact that nothing has hitherto been known of the causative organisms of the disease.

The incubation period is variable. Most cases develop within three or four days, though a few may be delayed for two, or perhaps three, weeks. A week is a very practical period for the supervision of contacts.

Scarlet fever is certainly infectious as soon as the first throat symptoms appear. The infectivity is at its height during the first days of the disease. In uncomplicated mild cases it soon begins to diminish. Many think that a large proportion of mild cases of scarlet fever are free from infection by the end of the third week; doubtless, at times, even earlier. Unfortunately in many cases the infectivity is greatly prolonged. The experience of the London hospitals shows that five, or six, per cent. of the cases are infectious for over six weeks. A few cases remain infectious for months. There seems to be a correlation between the complications and the duration of infectivity.

The infective material is certainly found in the throat secretions. The pathological condition also extends to the nose, as in diphtheria, giving rise to a nasal discharge, which is also infectious, as in the latter disease. So also is the aural discharge, but this is not so important. Nothing is known about the infectivity of the urine. There is a large amount of evidence that the exfoliated epidermis is not infectious. This can safely be disregarded in the release of patients. Patients should be isolated as long as there is any inflammation of the throat, any nasal, or aural, discharge. The latter may, however, at times be disregarded, especially if the ear is to receive proper treatment. The re

<sup>1</sup> Chesley: *Am. Jour. Pub. Health*, 1916, vi, 234.



removal of tonsils and adenoids, if the operation is indicated, is believed by many to shorten the period of infectivity. After every precaution is taken, it will be found that a certain number of cases, apparently entirely normal, are yet infectious, that is, they are true convalescent carriers. For a mild, uncomplicated type of the disease, probably four weeks is a reasonable period of isolation. When the disease is more virulent, and there are many cases with complications, it is doubtless safer to prolong it a week or two.

The disease frequently presents a very mild type. There are numerous cases with a slight sore throat, a very fleeting eruption and scarcely any fever. Sometimes there is no eruption. There are doubtless true carriers, that is, persons infected but presenting no symptoms whatever; but our knowledge of these is limited. There is evidence that the number of mild, unrecognized cases is large, perhaps equal in number to the reported cases.

Scarlet fever is not especially contagious. It is less so than measles, whooping cough, chicken pox, or smallpox. It is spread almost exclusively by contact with the fresh secretions of the throat and nose. It is rarely, if ever, airborne. Infection by fomites, as the term is ordinarily understood, is negligible. Infection almost never passes from one family to another in the same dwelling unless the families mingle.

Isolation of the case in the family is not very difficult. Too much should not be attempted. The most important matters only should be insisted on, otherwise complexity of detail will result in neglect. The patient, of course, must be kept in one room. One person only should act as nurse. A wrapper, which is kept in the room, is to be worn if much is to be done about the patient. On leaving the patient, the hands must always be washed in hot soap and water and well rinsed, preferably in running water. As few dishes as possible should be used, and these should be scalded and washed by themselves. Soiled linen should be placed in a wash-boiler or dishpan kept in the room, and should afterwards be boiled. It is preferable to have these procedures demonstrated by a nurse. It seems likely that frequent visits by a nurse during the course of the disease is the most effective means of securing proper care of the case and enforcement of rules. It is better than visits by doctors, or policemen, though the latter are sometimes needed.

Children in the family should not go to school. Those who are susceptible should be well isolated for a week. Later they may be allowed more freedom. Adults should not be seriously restricted. Milkmen and other food handlers should move away, also those who come much in contact with children. Laborers, mechanics, clerks, and indeed most wage-earners, need not be kept from their occupation.

The most expensive means of isolation is the

hospital, yet it is a necessity. There are a considerable number of persons who are so ignorant or careless, or who live under such bad conditions, that reasonable isolation at home cannot be secured. While the proportion of wage-earners who should be kept from work is not large, keepers of small stores connected with the house, peddlers of fruit, candy and ice cream, messengers and others, are apt to live so that home isolation is not practicable, and their loss of occupation would be a serious economic disaster. It is by no means necessary to attempt to provide hospital accommodations for from 90 to 95% of the cases, as is done in England. Probably if 40 or 50% of the cases most needing it, could be removed to a hospital, the full value of the latter would be secured.

## V.

### REPORT ON THE FATAL CASES OF DIPHTHERIA OCCURRING IN THE CONNECTICUT VALLEY<sup>1</sup> HEALTH DISTRICT IN MASSACHUSETTS DURING 1914.

BY JOHN S. HITCHCOCK, M.D., NORTHAMPTON, MASS.

DURING this past winter and spring the State District Health Officers of Massachusetts have been looking up the 1914 fatalities from diphtheria. The mortality from this disease was relatively high and there had been no material decline in it for several years prior to 1915, therefore it seemed well worth while to have the details concerning it on file. Because of the lapse of time and movements of people, this must be permanently incomplete, but we have learned some valuable facts. This paper is a preliminary report of this survey and covers only the facts learned by me in the Connecticut Valley District.

This District includes 1156 square miles, and contains 334,700 inhabitants, 213,684 of whom live in the four cities and 121,016 in the forty-three towns. The physical conditions vary from hill towns with a large acreage per person, to cities with densely congested districts; sanitary conditions, from crowded, filthy cabins in the country and tenement-house life in the cities, to the finest of country estates and the most modern of city houses; the character of the population, from the super-educated person of means and leisure, to the dull, non-English-speaking, recent immigrant.

From this District, in 1914, there were reported 598 cases of diphtheria, with 73 deaths, a case mortality of 12.2%. During this same year the case mortality of the State at large was 8.07%, and of the United States Registration Area 10.96%. These cases were located in the towns and cities along the river bottoms; none of the high hill towns reported a case, although three of them sent in specimens for examination.

Postal communication between many parts of



this District and Boston depends for promptness on catching certain mail trains, and renders the general use of the State Laboratory for diagnostic purposes unsatisfactory. There are several private and municipal laboratories that serve the section well. During 1914 the following diagnostic examinations were made:

By the State laboratory .....	192
By municipal and private laboratories .....	2064
	<hr/> 2256

A total of 3.78 times as many specimens as there were positive cases reported.

This examination of more than ten times as many specimens by local laboratories as were examined by the State Department laboratory is a clear showing of the inconvenience of the latter for use by the people in the western part of the State, and is a strong argument for the establishment of a branch of that laboratory in that section.

Among the poorer people here, just as elsewhere, a doctor's fee is not a light matter, while a sore throat in some member of the family is a common, almost constant, visitor, and one to whom home remedies are applied too confidently. As a consequence we find that among these 73 cases the doctor was called on the first day in 15, on the second day in 12, on the third day in 7; total during the first three days of 34, or 46.5% of cases, leaving 39 cases, or 53.5%, in which he was not called until the fourth day or later. Twenty-seven of the 73 cases, or 36.9%, died on or before the fifth day of the disease. This shows how often the doctor had only one day to work in.

Since diphtheria antitoxin is our standard remedy for the disease, we are interested in the record of its use here.

52 cases, antitoxin was given and the amount recorded
5 cases, antitoxin given, amount not recorded.
15 cases, no antitoxin given.
1 case, no facts learned.

In the 52 cases where details were recorded,

Total amount given.....	781,500 units
Average amount given.....	15,000 "
Largest total to one case.....	150,000 "
Smallest total to one case.....	1,500 "
Average initial dose.....	6,800 "
Largest initial dose.....	50,000 "
Smallest initial dose.....	1,000 "

Perhaps the most striking fact brought out by these records is, that, while the average amount used was 15,000 units and the average initial dose 6800 units, 26 cases, or 35%, received a total of 6000 units or less; and 23 cases, or 31%, received an initial dose of 3000 units or less, and the majority of these 73 cases were obviously in a serious condition when first seen.

Antitoxin was not given in 15 cases because

- 2 cases were dead when the doctor arrived,
- 2 cases died while antitoxin was being procured,
- 7 cases were moribund and the doctor thought it useless,
- 4 cases the family refused to allow its use.

If diphtheria cases were met with more frequently in general practice all physicians would carry a supply of antitoxin in their medicine cases; having to procure it not only delays its administration, but focuses the attention of the family on the procedure. They believe it must be an extraordinarily powerful and little used remedy, hence dangerous to the child, and opposition to its use is at once stirred up, especially among ignorant people. If, after its use, in spite of opposition, the child dies, the family is unshakably convinced that the death was due to the remedy, not to the disease.

#### TYPE OF THE DISEASE.

Pharyngeal only.....	32 cases, 43.7%
Laryngeal, or with larynx involved.....	41 cases, 56.3%

Of the laryngeal cases,

- 7 were intubated.
- 1 was tracheostomized.
- 4 died while being intubated.
- 1 intubation was refused.

#### DEFINITE CAUSES OF DEATH.

47 (64.5%)—Toxemia.
11 (15.0%)—Heart complications.
(7 myocarditis after apparent improvement.)
(4 sudden heart failure on exertion.)
7 (9.5%)—Suffocation.
3—Sepsis from co-existent infection.
2—General paralysis after six weeks.
1—Bronchopneumonia (after expulsion of tube).
1—Nasal hemorrhage (uncontrollable).
1—No record obtainable.
<hr/> 73

The record of the seven cases in which no antitoxin was given because the doctor in charge thought it was too late to be of any use, together with the statements made by physicians during the course of this survey, has compelled the writer to believe that many of us hesitate to use antitoxin to the best advantage because we have not a clear knowledge of its nature and action.

When I studied medicine, diphtheria antitoxin was unknown. When it was first introduced the common belief was that its action was directly bactericidal. That first learned impression stays in the front of my mind despite the fact that I know better, and it requires a definite mental effort for me to retire this impression behind the facts as we now see them. The same is evidently true of many of my confrères. Therefore, for the benefit of the older men, and at the risk of being tedious to the younger men, I propose to rehearse again the nature of this "antitoxin" and how it works.



To begin with, it has no direct bactericidal action whatever on the bacilli. It does two things: It neutralizes the poisons, the toxins, that the bacilli produce, and it takes away from the bacilli some of their unusually effective power to resist the attacks of our phagocytic cells. It neutralizes these poisons very much as an alkali neutralizes an acid, much as alcohol stops the corrosive action of carbolic, and like them, it does not repair any damage that may have already been done. It reduces the power of resistance to phagocytes very much as taking away the kick from a mule would reduce his power of resisting his enemies.

The antitoxic elements in the product we call "antitoxin" have no direct effects that are dangerous to human life. There is, however, a very real, though not a common danger in the use of this product, "antitoxin," which depends on the blood serum that is in it. The introduction of foreign protein into the blood of certain susceptible individuals may cause an explosion of sudden, alarming, even fatal symptoms. This series of symptoms is known as "anaphylaxis." I use the term with fear and trembling, it is so vague and varied in its meanings as used by different men. It seems sufficient for me to know in connection with diphtheria antitoxin that, in persons who suffer from "horse asthma" or "horse hay fever," that is, asthma or hay fever which is brought on by the smell of a horse, a dose of antitoxin may be immediately followed by sudden death, and, that in certain other persons with similar tendencies who have received one dose without showing any bad results, if a sufficient amount of time is allowed to elapse, the administration of a second dose, even a small one, may be followed by the same fatal symptoms.

Aside from these two rare conditions,—really phases of the same condition,—the use of antitoxin, even in large doses, is absolutely without danger to the life of the individual. Eczemas and urticarias are fairly frequently caused by it, but these, while at times distressing, are trivial effects when compared with the life-saving properties of the remedy.

The first of the phases of this actual danger may be guarded against by questioning the parents or friends as to the presence of this "horse asthma." If the patient is a sufferer from it, has a mild attack of diphtheria and you can probably carry it through along old lines of treatment, do so. If the case is severe and you need antitoxin, inject four or five drops and watch for an hour. If no untoward symptoms develop in that time, you can go ahead with the full dose in safety.

The second phase of actual danger is to be met by giving a sufficiently large initial dose to avoid having to repeat it.

In order to neutralize the poison of the bacilli the antitoxin must get into contact with it. If given subcutaneously, it is rather slowly

absorbed and its good effects do not appear for some hours. If the condition of the patient calls for quick action, it should be given intravenously. By this method neutralization of the toxins is accomplished far more quickly and with a much smaller dose of antitoxin than if the subcutaneous injection is used. Take those seven cases in the list reported in which the remedy was not given because the doctors thought them too far gone to be helped—it is well within the bounds of probability that some of them might have been saved by the intravenous use of the remedy. No patient while still alive is too far gone to be beyond the possibility of help from an intravenous dose.

An incident connected with this inquiry illustrates this as well as other points. A physician, when asked what killed a certain patient, said that he did, because he did not insist on the use of antitoxin before a positive laboratory report could be obtained. By reason of overgrowth, this was not secured for five days. The family then withdrew their prohibition and the antitoxin was given but without success. Within two weeks after my visit he was called as a consultant in a moribund case. In telling me about it later, he stated that, except for our previous talk, he would have agreed that it was of no use to do anything for this child, but that, since he did not care to tell me again that he had not done everything possible, he put 20,000 units into a vein and the child recovered. That very large dose neutralized the poison effectively and just in time.

Another point brought out is that the doctor assumed the responsibility of the death of the first child on the ground that he had lost time while waiting for the laboratory findings. As a matter of fact, he had taken two specimens daily in order to confirm his clinical diagnosis as soon as possible.

Another point brought out is that he had the courage to use the large dose of 20,000 units intravenously in this dire emergency.

The moral of all this is: Use antitoxin early and freely without waiting for confirmation of your clinical diagnosis even if it be only a tentative one. I agree heartily with the Boston Board of Health which suggests that any case that is clinically suspicious enough to warrant taking a culture for diagnosis is suspicious enough to receive antitoxin without waiting to hear from that culture. Time counts for so much in the efficacy of treatment for diphtheria that not a moment should be lost through indecision. In this series of 73 cases, the doctor's first visit was not made until the fourth day or later in 39, or 53.5% of the cases, while 27 cases, or 36.9% died on or before the fifth day. It seems fair to assume that the intravenous administration of antitoxin in large doses when these critical cases were first seen would probably have saved a number of these lives. Toxaemia was the cause of death in 64.5% of all these cases



and toxæmia is the very condition that antitoxin most surely controls. The degree of control will depend on the amount used and on the time and method of its administration as adjusted to the needs of the individual case.

The important factor of delay in calling the doctor is closely connected with the financial standing of the families, 91.8% of these deaths occurring in families in poor circumstances. The doctor's fee is no small item to them and he is not called for a sore throat unless it is a pretty bad one, consequently, sore throats treated by home remedies are so common that often neither the patient nor the mother connects a sore throat with other manifestations for which a doctor may be called in. In my opinion a doctor who fails to inspect the throat of every child under five years whom he is called to visit for any purpose or symptom is coming close to malpractice. No matter what the illness, the throat should be examined as a matter of routine. Many an unsuspected diphtheria has been unearthed in this way.

Heart complications rank second in our causes of death, being responsible for 15%. Of the 11 heart cases, seven died from myocarditis which appeared after the acute symptoms were over and convalescence was apparently established. In four of these seven the myocardial symptoms followed grave, unauthorized errors in diet, with resultant diarrhea and vomiting. Four of the heart cases died of sudden heart failure following muscular exertion: for example, one of them sat up quickly in bed to say "Hello!" to the nurse and dropped back dead. These heart cases should remind us that the disease is a serious one even when apparently mild, and that the period of convalescence requires careful and faithful oversight. Fifteen is a large percentage to be due to one complication.

This examination of fatal diphtheria cases has strengthened the belief in my mind that we possess adequate means for the general control of the disease in our diagnostic facilities and in our remedy, antitoxin. We seem to be still weak in our knowledge of the nature and action of this remedy and we show consequent hesitancy in applying it in its most effective form in the critical case. Both medical and lay persons still have wrong impressions regarding its powers and the dangers connected with it. The degree of our success in the clinical control of this disease will depend on the dissemination of accurate knowledge concerning it and concerning the nature and action of our effective remedy for it.

## VI.

### DIPHThERIA.

By WILLIAM H. PARK, M.D., NEW YORK.

THE invitation which was extended to me to address this meeting was largely given for the purpose of informing you of the results of the

investigations carried on in the New York City Health Department hospitals and laboratories in the use of the Schick test in estimating immunity and of the toxin-antitoxin mixtures in producing it. I appreciate the opportunity of appearing here.

Before taking up these subjects, I want to say a word about danger from sensitization to serum and the dosage of antitoxin. These subjects have already been ably discussed by Dr. Hitecock. So far as the danger of a repeated injection is concerned, I have long learned to have no fear of a second subcutaneous injection in those sensitized by a previous one. We have never had, in New York, a fatal accident from any injection except the first, and if it ever happens in other localities, it must be very exceptional. In fact, it has seemed to me that a person who has had a previous injection without serious results is insured against a fatal accident from any subsequent injection. An accelerated reaction is frequently met with, but this is disagreeable rather than dangerous. Sudden deaths have occurred in those having the condition of status lymphaticus and severe symptoms have occurred in those who have suffered previously from asthma. So far as the dosage is concerned, I entirely agree with Dr. Hitecock as to the importance of giving a sufficiently large primary dose, but he disagrees somewhat from me in the opinion that if an insufficient dose is given later, a larger dose will remove the harm of not having given sufficient at the first dose. Unless the first dose is very small indeed, the second and third doses have practically no effect. The toxin left untouched by the insufficient dose has acted and cannot be neutralized. A subcutaneous injection of antitoxin is supplying antitoxin to the blood for at least 48 hours from the time of the injection. The antitoxic globulin is very slow to be absorbed. We do not give the amount of antitoxin which we do because of any definite amount of toxin in the body which we are trying to match. Ten thousand units of antitoxin will undoubtedly neutralize 1000 times the amount of toxin in any case. We have frequently tested the amount of toxin in the serious cases entering the hospital and we have never found more than a fraction of a fatal dose for a guinea pig in 1 cc. of the serum. The large injection is given to lessen the interval between the injection and the absorption of sufficient antitoxin by the blood and its later passage to the lymph throughout the body and its access to the cells.

Before considering immunization, I wish to state a word about our having returned to the old practice, in New York, of requiring a period of 12 days before examining throat cultures for the removal of quarantine.

Investigation showed us that about 25% of the cases cleared before the twelfth day on two primary cultures were found to be still infected



when repeated and somewhat more careful cultures were made. As the majority of these mistakes were, as stated, before fourteen days, we decided to go back to our early methods and require twelve days after the beginning of illness before examining cultures for clearance. This does not prolong the average period of isolation for more than a day or two and it gives the family a definite period of 14 days to look forward to as the probable limit of isolation.

The use of the toxin-antitoxin mixtures to immunize children is an interesting recent development which has been taken up years after the experimental evidence suggesting it was obtained. Babes was the first to show definitely that if antitoxin was added to toxin just sufficiently to neutralize it so that it would not cause destruction of life in the guinea pig, it still did not prevent the toxin from causing, in the body of the injected animal, the production of antitoxin. Later, the different laboratories producing antitoxin confirmed his results and some used the mixture practically in the immunization of horses. Since 1897, the Health Department horses have been started with the toxin-antitoxin mixture. Several years ago, Dr. Theobald Smith definitely suggested, after experimenting with guinea pigs and showing the long immunity given by the mixture, that children be immunized. It remained, however, for von Behring actually to use it. His use of it was made practicable by the previous discovery of Schick,—that by the use intracutaneously of injections of minute amounts of toxin human beings could be divided into those which had antitoxin immunity and those which had not. The former were immune, while the latter were subject to possible infection. As you all know, he injected intracutaneously  $1/50$  of a fatal dose of toxin contained in  $1/10$  of a cc. of salt solution. We have usually used  $2/10$  of a cc., containing the same amount of toxin. Other modifications have been suggested, as for instance, Koplik uses a minute amount of the undiluted toxin held in the point of a needle. This loaded needle is simply inserted intracutaneously, and withdrawn after a few seconds.

Dr. Zingher, in the Health Department Laboratories has devised a very simple method of preparing the test toxin to be given in the usual way. A sufficient amount is placed in a glass capillary tube. This blown into 10 cc. of salt solution gives a strength in which  $2/10$  of a cc. contains  $1/50$  of a fatal dose. This dilution is not stable, and should be used only on the day upon which it is made. The undiluted toxin is quite stable when kept cool and protected from access of air.

We have now used the Schick reaction in some 12,000 healthy children in institutions, and in some 1500 convalescing cases of scarlet fever. As you know, infants at birth have an immunity transmitted to them from their mothers. This antitoxin is gradually eliminated, so that

in from six months to two years, it has disappeared. At about six months of age a certain proportion of children begin to produce antitoxin, and as they grow older a larger and larger proportion develop immunity. There is, therefore, a larger and larger proportion of susceptible children during the first few months of life, and then a lesser and lesser proportion as the self-developed immunity appears. In healthy children between two and four years of age, we have found 32% positive; from four to five years, about 25%; and for the following years, about 20%. That is, some 70% of all children are immune and some 80% adults. Curiously enough, it is found that among the children convalescing from scarlet fever there are about 50% more susceptible persons than among healthy children of the same age. This discovery probably accounts for Schick's greater percentage of positive reactions. Either those lacking immunity to diphtheria tend also to lack immunity to scarlet fever, or the disease itself lessens the amount of antitoxin.

Without the Schick test, all people exposed or to be possibly exposed to infection would have to receive either a passive or an active immunization if we wished to immunize them. The Schick test enables us to dispense with such immunization in about 70% of all cases. All who have used the Schick test know that it must be used with care. It is absolutely necessary to be sure that the toxin is of about the strength desired, because if it has deteriorated, of course no positive test develops in the susceptible. With suitable toxin, a negative test probably gives us absolute security that the case cannot become infected with diphtheria. There is a possible exception in very young infants, in which some claim a reaction does not develop with the usual strength of toxin, even though immunity is absent. A positive test may or may not be a real test, as a slight amount of diphtheria bacillus substance passes off to the culture fluid with the toxin, and this or the peptone may give a pseudo-reaction in those having antitoxic immunity. This occurs more quickly, and disappears more quickly than the toxin reaction. It is well in important cases to give either some heated toxin or some fully neutralized toxin as a control in order to differentiate between the true and pseudo-reactions. Cases that develop antitoxic immunity naturally probably remain immune for life.

*The Immunizing Injection.* The antitoxin is added to the toxin in sufficient amount so that an amount of the mixture containing an  $L^+$  dose of toxin produces a very slight local inflammation, but does not cause death of the injected guinea pig. We have injected a child under one year with about  $1/2$  of an  $L^+$  dose of neutralized toxin; a child under two, a full  $L^+$  dose; a child under four,  $1 1/2$   $L^+$  doses, and after that age, two full  $L^+$  doses. All injections are made subcutaneously. We have tried



in some cases a single injection, in others two and others three. The exact amount of the neutralized toxin and the number of doses is still under investigation. If people are injected who have natural antitoxin, a very rapid response is made, and within seven days marked antitoxin accumulation is obtained. In those, however, who have no antitoxin no appreciable response takes place for fourteen days, and in 50% not before four weeks. Not until three months does the full response take place. A quicker and more abundant production of antitoxin occurs after three immunizations than after two, but even after one immunization some 95% of the children are immune after three months. We have traced these children for from six months to a year and a half, and up to the present time, practically every case has remained immune. These 1200 children are in institutions and they will be tested every three months. Within a few years we will know definitely the length of the immunity. The very same results are found in animals, those having natural immunity responding rapidly and the others slowly, to the injections.

It is important to remember that only 95% of the susceptible become immune, and the remaining 5% of the non-immunes must be protected by antitoxin, in the presence of infection. We find that so far as the deleterious effects go, about 4% of the children show a marked reaction for twenty-four to thirty-six hours. We have seen no deleterious effect after the reaction has subsided. In about 10%, we have a rise in temperature of two degrees, and there is a local swelling, which seemed to be due more to anaphylaxis than to a toxin dose.

The results so far obtained prove that, while the toxin-antitoxin solution will not give any appreciable immunity until the lapse of at least two weeks, and usually not until four to twelve weeks, it will finally produce a lasting immunity in at least 95% of all children. It has, therefore, already become a practical measure in institutions. Its wider use must be determined after considering the degree of danger and the ease of administration. The Schick test has become established as one of great practical value.

#### VII.

### WHOOPIING COUGH: THE MEASURES TO BE TAKEN FOR ITS CONTROL AND PREVENTION.

By JOHN LOVETT MORSE, M.D., BOSTON.

THE mortality from whooping cough in children under five years of age in thirty states in 1911 was 6251; from scarlet fever, 4232; and from diphtheria, 9579; 3860 children under five years of age died of bronchitis and bronchopneumonia during the same period in eleven states in which 1216 died of whooping cough.

A considerable proportion of these cases were undoubtedly secondary to whooping cough, and should be charged up to it. The morbidity, mortality and percentage death rate of some of the most common infectious diseases in Massachusetts in 1915 were as follows: These figures are, however, owing to the imperfect regulations regarding vital statistics, only approximate.

Disease.	Morbidity.	Mortality.	Percentage Deaths.
Measles .....	22,356	142	0.6
Scarlet fever .....	8,520	189	2.2
Whooping cough .....	7,029	202	3.7
Diphtheria .....	9,330	648	6.8
Typhoid fever .....	2,189	195	8.9

In Boston, in 1915, there were reported 388 cases of typhoid fever, with 40 deaths; 2190 cases of whooping cough, with 111 deaths; 2959 cases of scarlet fever, with only 79 deaths; and 2942 cases of diphtheria, with 218 deaths.

It is evident from these figures that, instead of being a trifling affair, as it is usually considered to be by the laity and also, unfortunately, by many physicians, whooping cough is a most serious and fatal disease. It is certainly important enough to deserve, or rather to demand, far more strenuous efforts for its control and prevention than have been given it in the past.

There are certain other points in relation to the mortality from whooping cough which are also of great importance: 57% of the fatalities in the United States in 1906 were in the first year, 23% in the second, 8% in the third, 4% in the fourth, and 2.5% in the fifth year; that is, about 95% in the first five years of life. These figures are corroborated by many other more recent, but smaller, statistics. It is a comparatively mild affection in healthy children over five years of age, and after puberty it is rarely fatal. The importance of these figures will be evident when the measures to be taken to control the disease are considered.

The first thing to be done in the fight against whooping cough is to convince both the laity and physicians of the seriousness of the disease, and of the necessity for its control and prevention. Nothing of importance can be accomplished until they are so convinced. The only way in which they can be convinced is by a campaign of education, which must be led by the United States Public Health Service, the boards of health of a few of the states and large cities, and the pediatricians, who at present seem to be the only ones who appreciate the importance of the subject. How much such a campaign is needed is evident when it is realized that whooping cough is a notifiable disease in less than three-quarters of the states, that isolation is required in only one quarter of them, and then rarely enforced, that at least two states have no law forbidding the attendance of children ill with whooping cough at school, and that many other states allow the other children in the family to attend school, whether they



have had the disease or not. The regulations of the cities are better than those of the states, but many of them do not require notification, almost none of them isolation, and in several, children ill with whooping cough are allowed to attend school.

Physicians can be educated by lectures, circulars, articles in the medical journals and more stringent regulations for the control of the disease. Nothing will educate them more quickly than the imposition of fines for the failure to report cases of this disease. The laity can be educated by articles in the newspapers and monthly magazines, circulars, instruction by visiting nurses, advice of physicians, and the establishment and enforcement of stringent regulations as to the isolation of children ill with it.

It is necessary, in order to make satisfactory regulations for the control and prevention of a disease, to know in the first place what is the cause of the disease. If its cause is a micro-organism, it is also necessary to know how it enters and leaves the body, its habitat in the body, and its habitat and viability outside of the human body. The fact that the causative organism of a disease is known is of comparatively little avail, unless the early symptoms of the disease are sufficiently characteristic to suggest its presence, and the time at which it is contagious is known.

The recent investigations of Mallory have proved conclusively that the Bordet-Gengou bacillus is the cause of whooping cough. It is probable that there are many strains of this organism. The Bordet-Gengou bacillus enters the body through the mouth and nose. Its habitat is the respiratory tract, chiefly between the cilia of the epithelium lining the trachea and bronchi. It leaves the body in the secretions of the respiratory tract. It is present in the sputum in the catarrhal stage, and is most abundant at this time and in the first two or three weeks of the spasmodic stage. It has been found in the sputum as late as the eighth week of the spasmodic stage. It is fair to assume, therefore, that whooping cough, while most contagious during the catarrhal and early weeks of the spasmodic stage, is also contagious throughout the whole of the spasmodic stage. Kittens, puppies and monkeys may be infected with the disease. This probably happens so seldom under ordinary conditions, however, that infection from animals can, for all practical purposes, be disregarded. The Bordet-Gengou bacillus is very easily destroyed outside of the body. Indirect contagion is, therefore, very unusual, and of but little importance.

The staining of smears of the sputum by proper methods gives reasonably satisfactory results in the early stages of the disease. The organisms become progressively less numerous, however, and cannot be recognized if there is a complicating bronchitis or bronchopneumonia.

There is considerable danger, however, of mistaking the influenza bacillus for this organism in sputum. It is very important that the sputum to be examined is obtained from the trachea and bronchi, and not from the secretions of the nose and throat. The isolation and recognition of the organism by cultures is, however, too complicated a procedure for practical everyday use. It can only be done by an expert, and requires a considerable length of time. This method is, therefore, not practicable at present for preventive work.

An agglutination reaction is present in many cases, but it is not constant, and is usually not very high. Its presence is proof of whooping cough; its absence does not count much against it. A complement-fixation reaction is present in a considerable proportion of children ill with whooping cough and convalescent from it. The general experience has been that this reaction is seldom present earlier than the fourth day of the paroxysmal stage, at a time when anyone can make the diagnosis on the presence of the whoop and characteristic paroxysms. Friedlander, however, claims, by his special method of performing the test, to have obtained positive results in nearly 100% of cases in the catarrhal stage. The reaction is stronger during convalescence, and may persist for a good many months. Both of these tests are, however, too difficult of performance to be of practical utility for everyday use. The complement-fixation reaction should, however, especially if Friedlander's results are proved to be accurate, be of great service in the recognition of abortive and atypical cases under exceptional circumstances, when such recognition is of great importance.

There is an increase in the total number of white corpuscles, with an absolute and relative increase in the number of lymphocytes, in the catarrhal stage of whooping cough. The leucocytosis and lymphocytosis increase with the severity of the disease, reaching their highest point in the paroxysmal stage. There is either no leucocytosis or a leucocytosis with a relative increase in the polymuclear neutrophils, in the diseases with which whooping cough may be confused. This blood formula is a fairly constant one in whooping cough, and would be expected, therefore, to be of considerable assistance in its diagnosis before the appearance of the characteristic whoop. It is, however, not always present and may be absent, if there is some complication which is accompanied by a polymuclear leucocytosis. While, therefore, of some assistance in the early diagnosis of whooping cough, it cannot be trusted implicitly.

It is evident that, while the examination of the blood and sputum and the complement-fixation test are of undoubted value in the diagnosis of whooping cough, they are not at present of great practical utility in the recognition and prevention of the spread of this disease. It is



probable that in the future, with improvements in bacteriological technic, they will be of more assistance.

The greatest obstacles to the control and prevention of whooping cough are the facts that the early symptoms are so indefinite, that it is most contagious at the time when it is impossible to recognize it clinically, and that extremely mild types of the disease are not at all uncommon. It is possible, too, that whooping cough may, like certain other diseases, be spread by healthy "carriers." These facts should not be used, however, as arguments against the isolation of children ill with whooping cough, because whooping cough is undoubtedly contagious after its nature is plainly manifest. There is no reason why a child known to have whooping cough should be allowed at large to spread contagion, simply because it may have infected others before it was known to have the disease. An ounce of prevention may not be as good as a pound, but it is, nevertheless, an ounce.

Whooping cough must everywhere be made a reportable disease, and the same penalties imposed for failure to report it as in the case of smallpox, scarlet fever and diphtheria. The health authorities are then in a position to instruct the parents as to the seriousness of the disease, the way in which it is spread and the measures to be employed to prevent contagion. The importance of preventing babies from having the disease should be especially emphasized. The sputum and vomitus should be treated in the same way as in tuberculosis. The house should be placarded. It may be that this is not of great importance. It does, however, enable people to keep away from places where there is known to be contagion, if they wish to do so. It certainly seems reasonable to give people a chance to avoid known exposure, even if they cannot keep away from unknown contagion. The point to be especially aimed at in the isolation of whooping cough is to prevent the infection of babies and young children. The patients should be separated from the other children in the family, if they are under five years of age. If such separation is impossible, the patients should be removed by the health authorities to special hospitals provided for the purpose. These hospitals should be constructed on the "shack" plan, in order to give the children the maximum amount of fresh air, and thus to prevent the development of complications and cross-infection, and so situated that the children can be up and out of doors in suitable weather. There is no reason why children should be isolated in one room and not allowed to go out of doors, provided they are kept away from other children. They ought not to be allowed on the street at all during the acute and most contagious stage of the disease. Later, it may be allowable for them, provided they are attended by an adult. In order to protect other children

in case they do get on the street, they should be required to wear an arm-band of some prescribed color and labeled "whooping cough," in large letters. Arm-bands have been objected to and even ridiculed by certain writers. They claim that they are useless and unnecessary. It does not seem to me that they are, however, as there is no other way in which others can know that a child has whooping cough, unless they hear it whoop. If the child is labeled, careful parents can keep their children away from it. There is no other way in which children with whooping cough can be promptly recognized and certainly excluded from places of public congregation and public conveyances, which, as everyone agrees, should be done. It would not be a bad plan to compel children who have been exposed to whooping cough also to wear a band. Children who fail to observe the quarantine regulations should be at once sent to the hospital by the public authorities, no matter what their circumstances or social position.

There is considerable difference of opinion as to how long quarantine should be kept up. Some authorities believe that, as the Bordet-Gengou bacilli are seldom present in large numbers in the sputum after the first two weeks of the paroxysmal stage, it is useless to continue the quarantine beyond this period. This does not seem to me to be a reasonable position, because the organisms have been found as late as the eighth week, and because in the later stages of the disease the organisms, although they may be present, are very difficult of recognition on account of the large number of the other bacteria. Still other authorities fix a certain number of weeks as the period of quarantine, without regard to the severity and duration of the symptoms in the individual case. It would seem more reasonable to fix the time of quarantine at one week after the cessation of the characteristic paroxysms, as these paroxysms presumably mark the active period of the disease. If such a regulation is not feasible, a quarantine of five or six weeks is a reasonably safe one. It is to be hoped that in the future such advances will be made in the recognition of the Bordet-Gengou bacillus, both in smears and cultures, that the period of quarantine can be regulated in the same way as is now done in the case of diphtheria.

The vitality of the Bordet-Gengou bacillus outside of the body being slight, formal disinfection is not necessary. Thorough cleaning and airing of the premises is all that is required.

The other children in the family should not be allowed to attend school unless they have already had the disease or until two weeks have elapsed since the last exposure, provided they are free from catarrhal symptoms. It is possible that this period of two weeks may be too short, the evidence as to the length of the incubation period of whooping cough being unsatisfactory. Present observations seem to



show, however, that it varies between two and ten days. Two weeks should, therefore, be amply sufficient. Children with catarrhal symptoms, in whom there is any reason to suspect the possibility of whooping cough, should also be excluded from school.

It will be impossible to control whooping cough properly and prevent its spread until hospitals for the accommodation of children ill with whooping cough are established by the community. Such hospitals are necessary for several reasons: first, to take care of those children whose parents, because of poverty or ignorance, cannot give them proper care and isolation at home; second, to protect the public by isolating those children whose parents are unwilling to obey the regulations as to quarantine; third, to give suitable hospital treatment to babies and children seriously ill with the disease, and its complications—bronchitis and bronchopneumonia.

Objections to the establishment of hospitals for the care of whooping cough have been raised on the grounds that only a small proportion of the cases can be taken care of; that on account of the difficulty in recognizing the disease in its early stages, when it is probably most contagious, the children are admitted too late to afford much protection to the public, and that there is great danger of cross-infection and the development of bronchopneumonia in hospitals. The first two objections are, to a certain extent, valid. It does not seem reasonable, however, to argue that it is needless to do anything to protect the public from whooping cough simply because the protection afforded cannot be made perfect. It seems to me that a little protection is better than none. Experience in hospitals built on the "shack" plan, in which the patients get an abundance of fresh air, has shown that the last objection has no foundation in fact.

It is obviously impossible to treat children ill with whooping cough in dispensaries or outpatient departments where other children are treated. It would be hard to find better places in which to spread contagion. Nevertheless, there are a large number of ambulant cases of whooping cough which would be benefited by treatment in dispensaries. Dispensaries for the treatment of whooping cough, and nothing but whooping cough, should, therefore, be established in the thickly settled portions of our large cities. The patients treated should, however, come only from the immediate neighborhood, because of the danger of spreading contagion if they come in public conveyances. The City of New York established such a clinic not quite two years ago. The results obtained have been most satisfactory, and warrant the establishment of more stations.

It is obvious that, if there was some method of treatment which had a curative action in whooping cough and would protect against the

development of the disease, it would aid more to control, prevent and diminish the mortality from whooping cough than all the other means which have been considered together. Such an action has been claimed for the vaccine treatment. Hartshorn and Modler, writing in August, 1914 (*Archives of Pediatrics*, 1914, xxxi, 586), reviewed all the literature of the subject up to that time, a total of 1445 cases. They concluded that there was no universal endorsement of the vaccine treatment, although there was a striking lack of negative reports, that there was no definite standard of dosage, and that the dosage had apparently often been too small. They decided that its value as a prophylactic agent was undetermined, that the earlier the treatment was begun the better were the results, and that it was worthy of a more extended trial. Their own results in seventeen cases were inconclusive. Their conclusions represent the consensus of opinion of conservative observers at that time. The results of Hess (*International Clinics*, 24, s. iii, 97), Frankel (*Kentucky Medical Journal*, 1915, xiii, 458), and the New York City Board of Health, reported by Luttinger (*New York Medical Journal*, 1915, ci, 1043), are, however, more favorable. Hess used the vaccine as a prophylactic in an epidemic of whooping cough in the New York Hebrew Asylum; 244 children were given the vaccine and only 21 developed whooping cough, a percentage of 8.6; 131 others were not given the vaccine. A considerable proportion of these were babies who had practically no exposure. Sixty of 80 who were exposed, or 75%, developed the disease. Frankel gave prophylactic injections to 10 babies in an institution, who were constantly exposed. None of them contracted the disease. Luttinger gave nine prophylactic injections and none of the children developed pertussis. He also treated 138 children with vaccines, 115 of them being within the first three weeks of the paroxysmal stage. In comparison with a control series treated in other ways, the paroxysmal stage was shortened by over two weeks. There was, moreover, a prompt amelioration of the symptoms in nearly all cases. These results seem to show that vaccines are of considerable value as a prophylactic against whooping cough, and that they have some curative action after the disease is established. It is to be hoped that these results will be confirmed in the future. At present they certainly seem to make it advisable to use vaccines as a prophylactic, and justify their further trial in the treatment of this disease. The most favorable results have apparently been obtained with polyvalent stock vaccines. The dosage recommended by the New York City Board of Health for prophylaxis is, for children, 500 millions, one billion and two billions, at three-day intervals. They advise for treatment, an initial dose of 250 millions for children less than one year old, this dose to be



doubled every second day. Children over a year receive an initial dose of 500 millions. The dose may be increased as high as 10 billions.

If the vaccines prove to have the value in prophylaxis and in treatment which the results of the last two years suggest that they may have, the control of whooping cough will be a relatively simple matter. Even if they do not, however, it can be confidently predicted that when physicians and the public understand what whooping cough really means, when proper regulations for its control are established and enforced, and when sufficient hospital and dispensary accommodations for its care are provided, whooping cough will cease to be the scourge which it now is.

### Book Reviews.

*The American Year-Book of Anesthesia and Analgesia.* Edited by F. H. McMECHAN. New York: Surgery Publishing Company. 1915.

This publication has been established for the collation of the world's scientific research on anesthesia and analgesia and represents the collaboration of well-known experts in the various fields of these subjects. It is the intention that this first issue should summarize the progress in them to the present time. Subsequent issues, by means of collected abstracts, are to continue the revision of these subjects as necessity arises and will deal also with other new subjects of equally interesting importance. This volume contains thirty-one articles on selected topics. Among these may be noted one by Dr. George W. Crile of Cleveland on "Anesthesia, Anemia and Resuscitation;" by Dr. James Taloe Gwathmey of New York City on "Ether-Oil Colonic Anesthesia;" by Dr. Kurt A. Thoma on "Local Anesthesia for Dentistry;" by Dr. Yandel Henderson and Dr. W. T. Porter of New Haven, Conn., and by Dr. George G. Smith of Boston on spinal anesthesia in neurology. The work is illustrated with a large number of excellent figures and constitutes a useful contribution to the knowledge and progress of anesthesia.

*Diseases of the Skin.* By RICHARD L. SUTTON, M.D., Professor of Diseases of the Skin, University of Kansas School of Medicine, 693 Illustrations and 8 Colored Plates. St. Louis: C. V. Mosby Company. 1916.

Dr. Sutton has written an excellent textbook along the lines that he has chosen, his purpose being "to present the entire subject of dermatology in a comprehensive and at the same time concise manner." The style is clear and succinct, and the wording well chosen and plain

a model of its kind, in the midst of the number of loosely written treatises that have appeared of late years. Besides a proper amount of space devoted to the more common dermatoses, the author has added a few valuable and timely words on subjects that are of considerable dermatological interest, but are accorded as a rule either a brief notice or none at all. Among these subjects may be mentioned "X-ray and Radium Dermatitis," "Tattoo Marks and Powder Stains," "Paraffinoma," "Frambesia," and "Brown-tail moth." On the subject of treatment he is refreshingly concise and logical, maintaining a wise conservatism on many of the newer methods that are still *sub judice*, but that have been over-exploited by those ever ready to seize the innovations, while forgetting the services that have been rendered by the well-tried procedures. For example, with regard to the vaccine treatment of acne, he voices the judgment of the majority of experienced dermatologists in declaring that it has proved extremely disappointing, and adds that he has practically abandoned its use. The book is a thoroughly American book, and gives a considerable prominence to the views and to the work of American authors. The illustrations are all excellent, and do not comprise any of the time-honored but antiquated reproductions that mar so many of the textbooks with which we have of late been swamped. A number of inaccuracies and typographical errors will be rectified in the succeeding editions. The author is to be congratulated upon having outstripped most of the recent competitors in this field of medicine.

*An Index of Treatment.* By various writers. Edited by ROBERT HUTCHISON, M.D., F.R.C.P., and JAMES SHERREN, F.R.C.S. Revised to conform with American Usage by WARREN COLEMAN, M.D. Seventh Edition revised and enlarged. New York: William Wood & Company. 1915.

The sixth edition of this standard work on therapeutics was reviewed in the issue of the Journal for October 3, 1912 (Vol. CLXXIV, page 481). In this seventh edition all the articles have been thoroughly revised and in many cases rewritten. Several new articles have been the psychoneuroses. In this American edition the dosages of drugs have been modified to conform with the United States Pharmacopoeia and National Formulary. The text of the English edition has also been slightly altered in a few articles. The subjects, which are arranged alphabetically from abdominal myiasis to yellow fever, have been contributed by a number of distinguished physicians and surgeons. In this edition Mr. Sherren replaces Mr. H. Stanfield Collier as surgical editor. An appendix contains a number of useful prescriptions and the entire work should continue its popular practical value to the profession.



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## ANCIENT HISTORY OF YELLOW FEVER.

SEVERAL interesting documents pertaining to the earlier history of yellow fever in the United States, which have recently come to our attention, illustrate interestingly the rapidity with which medical progress, viewed in retrospect, has advanced in the light of discoveries made not really so long ago, yet proving revolutionary in their consequences. One of these documents is a clipping sent by a Boston physician, a former editor of the JOURNAL, from a newspaper of September 17, 1873, describing an epidemic of yellow fever then in progress at Shreveport, La. A telegram to New York on September 16 stated that there were then six hundred cases of the disease at Shreveport and not enough well people left to care for the sick. "The fever is unusually fatal. It is believed to be Mexican vomito introduced by a circus." Evidently the fever was at the same time prevalent also at

Memphis, Tenn., Little Rock, Ark., and other points throughout the South. A news report from Memphis on September 16, 1873, said:

"There is no abatement of the yellow fever, though its ravages are almost exclusively confined to the northwestern portion of the city, adjacent to the mouth of Wolf River, where it first appeared. It is impossible to obtain reliable data in regard to the mortality, but it is evident that there is no decrease in the death rate. The city authorities today took the first steps towards meeting the exigencies of the occasion. The whole street force is being put to work distributing coal tar and burning it in the infected quarter. The white citizens met and organized a Howard Association. The association will open an office tomorrow, and be prepared to furnish nurses and relief to all who apply. Physicians are advising all that can to leave the city, and the trains in all directions are crowded. The wildest reports are circulated throughout the country in regard to the number of dying, but it is safe to say that since the disease appeared the number of deaths from all causes has not reached twenty on any other day, and since the flight of the horror-stricken ones there is less excitement than during the prevalence of the cholera."

The following sketch of the city of Shreveport at that time presents a vivid picture of the local conditions of suffering, apprehension and disturbance of daily life produced by a typical yellow fever epidemic in the days before knowledge had robbed the disease of its terror.

"Shreveport, where the yellow fever has been creating such terrible havoc, is the second city in Louisiana, both in population and commercial importance, it being the great centre of trade for the Red River country. Before the war it had about three thousand inhabitants, but on the close of the war many Northern men went into business there, and the place became an active, enterprising business city, rapidly growing in population, until it is now estimated to have between 10,000 and 13,000 inhabitants. It owes its commercial importance to the fact that it occupies the only available site on the Red River for such a place, there being no good landing place on the west bank of the river within a hundred miles. The Red River valley is the richest region in the country for the production of sugar and cotton, and this makes Shreveport one of the greatest markets in the valley of the Mississippi, or its tributaries, for those staples. Shreveport is something like five hundred miles up the Red River, and is one hundred miles west of Vicksburg. It is at the head of steamboat navigation, and fifteen miles below the great Red River raft, which is one of the most remarkable formations in the world, being a mass of logs and driftwood over forty miles long, and entirely choking up the great stream, which is over 1200 miles long, or, including the



South Fork, 2100. This raft turns the water of the river over the adjacent country, forming great bayous, through which, at high water, steamboats pass around the raft. It has been forming for many years, and is now being removed by the national government. The work is prosecuted by blasting, and when the improvement is completed, steamers will be able to go without interruption up to Fulton, and at high water the river will be navigable as far as the confluence with the branches. Shreveport is on high ground, forming a bluff at the river bank, and is well situated for drainage. The whole country around is flat, and for miles and miles there is one continuous succession of marshes, swamps and bayous, for over one hundred miles to the west, there being one chain of the great bayous formed by the raft. Though at low water a great surface is exposed to the action of the sun, making the surrounding country subject to malarial influences in the hot season, still the health of the city has generally been good. This is the third time the place has been visited by the yellow fever to any extent since it was settled, the first time having been in 1853, and the second in 1867. There has, however, never been anything like the terrible pestilence which is now devastating the place. Many who are conversant with the matter, charge the affliction directly to the Kellogg government. For several months the place has been without a municipal government, the city government elected by the people having been deposed. Those having control of the city have been utterly neglectful of their duty, and the streets were in an indescribably filthy condition. Under the hot semi-tropical sun the reeking heaps of garbage became the sources whence the seeds of the pestilence sprang into active life. The indifference of the lower classes, ignorant of the danger which threatened, aggravated the evil brought about by the criminal neglect of the authorities. Then a steamboat, with hundreds of cattle on board, sunk opposite the city. The cattle were carried down with the craft, and there was no attempt made to move them. The receding waters left the wreck exposed, and there, day after day were seen, in full view, the putrid carcases, rotting in the hot sun, and vultures revelling in carrion. From this sickening stench, powerful and penetrating, was wafted over the unfortunate city, and hastened the coming of the dread disease. The yellow fever soon made its appearance in its most malignant type. Everyone who could left the city, no one remaining behind but the poor and those compelled by the greatest necessity. The present condition of affairs is truly pitiable, and the stricken place deserves the sympathy and aid of our more fortunate citizens.

The second document, to which reference was above made, is a sketch of yellow fever in Florida by a Boston physician, the manuscript of

which is dated December 6, 1888, just ten years before the work of Walter Reed and his commission. The text of this hitherto unpublished sketch is as follows:

"The usual climatic influences of the season of the year may probably be safely relied upon to hold at bay for some months the yellow fever scourge which has presented itself in epidemic form at various points in the state of Florida during the past summer and autumn. The longer and warmer days, however, will soon return, and with the increasing power of the sun all the necessary elements to start into renewed activity the dormant disease-germs which are allowed to linger through the winter.

After the unsuccessful campaign of the season just ended against the disease, the renewal of the struggle is already anticipated with anxious expectation by the inhabitants of the infected communities and by those of neighboring States lying within the yellow fever zone. Questions of prevention are of the first importance, and destruction of disease germs is the problem of the moment.

Among the objects universally recognized as most dangerous foci of infection are the clothing, bedding and personal effects of families among whom cases of yellow fever have existed. There are reasons to believe that by such household articles, yellow fever was carried from Havana to Key West last year.

There is probably but one opinion among competent and impartial judges as to the desirability, we might better say the imperative necessity, for the thorough disinfection, or, where bulk renders thorough disinfection uncertain or impossible, the complete destruction of such suspected articles. On the other hand, the destruction of these things, without compensation, is impossible, whether from the practical or the humane point of view.

Granted that there should be effective destruction, and that there must be compensation, it is simply a question of whence the compensation should come. State rights and privileges should carry with them state duties; but in Florida there is no central sanitary authority, the smaller communities are very poor, and even a city like Jacksonville is said not to be in a condition to do this work for itself, being hampered by a charter provision which forbids an annual expenditure greater than 1% of its assessed valuation; it has no ready funds, and



the Sanitary Auxiliary Association is reported to have recently loaned the city \$5000. Under such circumstances local authorities can hardly be trusted with the execution of the proposed prophylactic measures.

Drs. Porter and Guiteras, as agents of the United States through the Marine Hospital Bureau, have been already engaged in a house-to-house inspection in the city of Jacksonville and elsewhere and have ordered the destruction by fire of such articles as they deem necessary, for which no compensation is provided. Poor people, however, will not give up their bedding to be burned, without compensation, and it seems almost inevitable that the Federal Government must in this instance, however bad such precedents may be, assume the expense, as well as the responsibility, of making such measures as effective as possible. An appropriation of \$100,000 was made by Congress for stamping out the epidemic, and some of this should be available.

On the other hand, even should the necessary funds be available to insure the effective destruction of existing fomites, there seems to be no present security and no reasonable probability of future security against the repeated introduction from Havana of equally pestilential articles. Even a patrol or blockade by United States cruisers of a coast with the length and peculiar characteristics of the Florida coast would offer a poor guarantee against the light-draught, fast sailing "viveras" or fishing smacks and the tramps which carry on a traffic, legitimate or illegitimate, between Cuba and Florida. In all probability, whatever measures are adopted by our own federal or local governments, as long as there exists at the very doors of our Southern States such a breeder of yellow fever as the port of Havana, they will be liable to epidemic outbreaks of this disease. A recent report, even though not confirmed, of the arrival in a New York tenement house of a family direct from Jacksonville, one member of which developed suspicious symptoms, is an indication of what may be anticipated, and serves to remind us that in the questions to which we have alluded, all parts of the country are concerned."

Appended to the above sketch is a note of comment by another physician, then connected with the United States Army Medical Service in Washington, in which he calls attention to

the fact that there are abundant means for disinfecting clothing and bedding, presumably infected by yellow fever, which do not involve their destruction as burning does.

"No one, I presume, doubts that boiling for 15 minutes would be quite sufficient to destroy the yellow fever germ. Nor do I believe it would survive 24 hours' exposure to the concentrated fumes of sulphurous acid. Simple boiling and washing is, however, in my judgment, amply sufficient protection combined with thorough aeration of enclosed spaces. As to the general principle that the United States must do this work if it is to be done, I think no one who is acquainted with the condition of affairs in Southern towns will have any doubt. It may not be according to the Constitution, 'as amended,' but it is a necessity all the same. I have taken the ground for the last eight or ten years, that we have a right to demand of the Spanish and Cuban governments that Havana shall be put in decent sanitary condition, on the ground that it is a standing menace to us, as it now is, and I do not believe that any effectual protection of the Gulf Coast from yellow fever will be attained until we do this."

These two documents, dating less than thirty years ago, and representing the best and most expert medical opinion of their time, afford further and striking evidence of the rapidity of medical progress. The history of yellow fever in America during even the second half of the nineteenth century has become already ancient history. Thirty years hence, when we know the whole truth about poliomyelitis, we may look back in the same manner upon our present theories about its transmission and prevention.

#### PROGRESS OF POLIOMYELITIS.

DURING the past week there has been a definite decline in the prevalence of poliomyelitis throughout the United States. The weekly report of the United States Public Health Service for October 27, 1916, gives the case incidence of the disease in September as follows: New York (exclusive of New York City), 1064; New Jersey, 957; Pennsylvania, 743; Massachusetts, 623; Connecticut, 274; Illinois, 257; Minnesota, 186; Michigan, 166; Wisconsin, 158; Ohio, 138; and Maryland, 100. In October there were 125 cases in Maryland.

In Massachusetts the total number of cases reported in October was 704, with 59 deaths, the largest number in any month during the present epidemic. During the first eleven days of No-



vember 107 new cases were reported in Massachusetts, making a total of 1823 in this State since January 1, 1916.

At its annual meeting in Cincinnati, Ohio, on October 26, the American Public Health Association adopted the following resolution:

"In view of the fact that infantile paralysis has existed for several months and still exists in the United States and Canada, taking on in some localities an epidemic character; that considerable anxiety is expressed by the public generally, and that they, the public, the physicians, and the health authorities may well expect an authoritative statement upon the subject from this Association in annual convention assembled:

"*Be it resolved*, That the president be forthwith authorized to appoint a small committee of specialists and of those who have had experience of the disease with instructions to meet immediately and to prepare a report of the present actual knowledge of the cause of the disease, the manner and agents by which it is spread, the best methods of treatment, and the best preventive measures.

"And that this committee submit its report before the close of this annual meeting, and that such report be given to the public immediately."

In accordance with this resolution, Dr. John F. Anderson, president of the Association, appointed the following physicians to constitute the committee: Dr. Haven Emerson, health commissioner of New York City; Dr. Wade H. Frost, of the United States Public Health Service; and Dr. A. J. Chesley, director of the division of preventable diseases of the Minnesota State Department of Health.

In its report, after summarizing present knowledge of the disease, this committee concluded as follows regarding its prevention, control, and treatment:

"If the foregoing conception of the disease is correct, it is obvious that effective preventive measures, approaching complete control, are impracticable, because isolation of recognized cases of the disease and restraint upon their immediate associates must fail to prevent the spread of infection by unrecognized cases and carriers. These difficulties would appear to be inherent in the nature of the disease. Nevertheless, we may hope for the development of more thorough knowledge, which will permit of more effective control of the disease than is now practicable. Of first importance is the more general recognition by practitioners of non-paralytic cases through clinical observation and laboratory procedures. Lumbar puncture has been shown to offer valuable aid in diagnosis, and a more general use of this test is to be en-

couraged, since it not only facilitates accurate and early diagnosis, but in many cases affords symptomatic relief as a therapeutic procedure. Without undertaking to predict the future progress of research, we may hope for certain possible developments which may afford far more effective control of the disease, with substantial relief from many inconveniences at present inevitable. Among these possibilities we would include a practical test for the detection of all clinical types and carriers, a simple and reliable test for distinguishing between susceptible and insusceptible persons, and means of conferring artificial immunity against poliomyelitis.

"At present our information demands the employment of the following administrative procedures in attempting to control the disease:

"1. The requirement that all recognized and suspected cases be promptly reported.

"2. Isolation of patients in screened premises. The duration of infectivity being unknown, the period of isolation must necessarily be arbitrary. Six weeks has been recommended by the Conference of State and Territorial Health Officers with the Surgeon-General of the Public Health Service as sufficient, and this period has been generally accepted throughout the United States.

"3. Disinfection of all body discharges.

"4. Restriction of the movements of intimate associates of the patient as far as practicable. This should include, at least, exclusion of the children of the family from schools and other gatherings.

"5. Protection of children, as far as possible, from contact with other children or with the general public during epidemics.

"6. Observation of contacts for two weeks after the last exposure."

This report is published in full in the weekly bulletin of the United States Public Health Service for November 3, 1916.

## THE POSITION OF STATE EPIDEMIOLOGIST.

IN another column of this issue of the JOURNAL, we publish a notice of a competitive examination for qualification to the position of epidemiologist in the service of the Massachusetts State Department of Health, with the stated regulations governing the appointment of this official. The attention of interested physicians is directed to this notice. The position is one of value and importance to the public and offers attractive prospect of opportunity for service to physicians properly qualified to undertake it. It is highly desirable that the best fitted



candidate should be obtained for this position, and it is expected that the competition for it will be active.

### MEDICAL NOTES.

**FUMIGATION OF ENGLISH STEAMERS.**—United States Federal Health officials have issued a recent order directing the fumigation of steamers arriving at Boston from certain English ports. The reason for this order is believed to be the occurrence of cases of bubonic plague in these ports. During the period between July 1 and October 27, three cases of the disease were reported at Bristol, two at Hull and five at Liverpool.

**PREVALENCE OF DISEASE IN THE UNITED STATES.**—The weekly report of the United States Public Health Service for October 27, 1916, states that during the month of August there were 28 and in September 15 cases of cerebrospinal meningitis in New York. During September 33 cases of smallpox and 1002 of typhoid fever were reported in Ohio. During the same month there were 28,516 cases of malaria and 455 of pellagra in Mississippi; 725 cases of typhoid fever in New York, 676 in Mississippi, 607 in Indiana, 388 in Michigan, 373 in Kansas, 313 in New Jersey, 308 in West Virginia, and 253 in South Carolina.

**TUBERCULOSIS SUNDAY.**—It is announced that Sunday, December 3, has been selected for the seventh annual observance of Tuberculosis Sunday throughout the United States. Its purpose is to intensify the education of the public on the subject of tuberculosis and the collection of funds for its relief.

**COMBATING INSECTS AFFECTING THE HEALTH OF MAN.**—Continued advances in the work of combating the activities of insects affecting the health of man are reported by the Chief of the Bureau of Entomology of the U. S. Department of Agriculture in his annual report recently issued. In mosquito investigations in Louisiana, a species of mosquito hitherto considered a non-carrier of malarial infection was proved to be a carrier. Studies have been made of malaria, and measures are being evolved to meet plantation conditions.

The "starvation" plan, aimed to exterminate the spotted fever tick of the Bitter Root Valley, Montana, was followed during the year with encouraging success. The plan consists of the removal of the domestic hosts of the adult tick from the infested areas. The Bureau also conducted a campaign of extermination against ground squirrels and other rodent hosts of the immature ticks. Examination of the rodents killed showed 40% lower infestation by the tick than during the preceding year.

The report directs attention to the demon-

stration of the Bureau specialists, that the breeding of flies in manure can be prevented by treating the substance with calcium cyanamid and acid phosphate, which at the same time increase the fertilizing value of the manure.

The Bureau also conducted investigations into methods of lessening fly infestation in packing establishments operated under the Meat Inspection Service of the Department.

### EUROPEAN WAR NOTES.

**MEDICAL ASPECTS OF THE MESOPOTAMIAN CAMPAIGN.**—In the issue of the *British Medical Journal* for October 21, 1916, is published an analysis of Sir Percy Lake's dispatch describing the operations of the British troops from January 19 to April 30, 1916, in their unsuccessful attempt to relieve the siege of Kut-el-Amara. After description of the natural features of the country involved in this campaign, Sir Percy refers frequently to the difficulties attending not only the transportation of troops, munitions and food, but the removal of wounded from the field.

"As far as possible, all the wounded were brought in during the withdrawal, but their sufferings and hardships were acute under the existing climatic conditions, when vehicles and stretcher-bearers could scarcely move in the deep mud."

According to the statement of the late Sir Victor Horsley, quoted in an editorial in the same issue of the *British Medical Journal*, "the immediate cause of the appalling failures in the medical arrangements was the utterly defective transport." Sir Percy Lake, in his general summary, at the conclusion of his report, says, in commendation of the personal efficiency and heroism of the medical corps:

"The energy and devotion to duty shown by the personnel of the medical services deserve commendation. Overworked and undermanned as they were during the advance in January—for the greater portion of the medical organizations then in the country had been shut up in Kut, and the medical units of the 3d and 7th Divisions had only begun to arrive—they did their utmost with the means at their disposal to alleviate the sufferings of the sick and wounded. With the arrival in February of the first river hospital ship, *Sikkim*, and a steady increase in personnel, their power of dealing with the situation was considerably improved, as the action on March 8 showed.

"No report on the medical services would be complete without reference to the splendid services rendered by Mr. T. A. Chalmers, of Assam, who brought out, and himself drove, his specially designed motor boat, *Arick*. He spent his whole time, frequently under fire, in conveying sick and wounded between collecting stations, field ambulances, and river hospital craft in a



manner which no other boat in our possession could have imitated."

Of the military expedition itself, the commenting editorial of the *British Medical Journal* says:

"It would not be easy to mention any British military operation on so large a scale, since Walcheren, which failed so completely, and at so heavy a cost in casualties, medical and surgical, as the attempt to relieve General Townshend's Anglo-Indian force besieged in Kut."

The Walcheren expedition was an unsuccessful and disastrous British campaign against the French in the Netherlands in 1809.

**AMERICAN AMBULANCE AT SALONIKI.**—Report from Paris states that the American Ambulance Field Service of thirty-one ambulances, two supply cars and twenty-five volunteers, left that city on October 12 for Saloniki. This unit, which for the past eighteen months has rendered distinguished service in Alsace-Lorraine and at Verdun, remains in charge of Mr. Lovering Hill of New York, who has been its leader on the western front.

**WAR RELIEF FUNDS.**—On Nov. 11, the totals of the principal New England relief funds for the European War reached the following amounts:

Belgian Fund .....	\$164,208.08
French Wounded Fund .....	132,570.12
Armenian Fund .....	114,856.50
French Orphanage Fund .....	69,594.39
Surgical Dressings Fund .....	56,858.06
Belgian Tobacco Fund .....	43,528.19
Italian Fund .....	27,193.54
Facial Hospital Fund .....	24,491.03
LaFayette Fund .....	20,799.53
P. S. D. Fund .....	10,197.18
French Phthisis Fund .....	6,309.50

#### BOSTON AND NEW ENGLAND.

**WEEK'S DEATH RATE IN BOSTON.**—During the week ending Saturday noon, November 11, 1916, the number of deaths reported was 255, against 182 for the same period last year, with a rate of 17.49 against 12.68 last year. There were 34 deaths under one year of age, against 32 last year, and 66 deaths over 60 years of age, against 55 last year.

The number of cases of principal reportable diseases were: diphtheria, 32; scarlet fever, 18; measles, 10; whooping cough, 6; typhoid fever, 5; tuberculosis, 34.

Included in the above were the following cases of non-residents: diphtheria, 7; scarlet fever, 4; typhoid fever, 1; tuberculosis, 3.

Total deaths from these diseases were: diphtheria, 4; measles, 1; whooping cough, 1; tuberculosis, 14.

Included in the above were the following deaths of non-residents: diphtheria, 1; tuberculosis, 1.

## Correspondence.

### GAPS IN MEDICAL EDUCATION.

Boston, October 27, 1916.

Mr. Editor:

Many years ago I read with pleasure and admiration a book of careful anatomical research written by Dr. John Calvert Donaldson, now of Philadelphia, on the development of the brain, and I remember a sentence which expressed a provisional conclusion with reference to the question whether or in what sense we have a right to expect a gain among the races of men, in respect to the higher mental qualities, as time goes on. The sentence to which I refer was couched in something like the following words:

Knowledge increases, for the obstacles to knowledge are mainly from without; but wisdom lingers, as the rare product of a balanced brain.

The truth of this sentiment has been brought home to me from time to time, as I suppose it is to everyone, through coming indirectly in contact with practitioners who have gained scientific knowledge and scientific skill, which they utilize for the benefit—or otherwise—of their patients, without exerting at the same time a proportionate amount of wisdom in so doing.

It is my belief that medical schools have a certain responsibility in this matter, and that they ought to do their best not to turn loose upon the community men who are skilful and efficient without being wise. In other words, I think that medical ethics, obligations and responsibilities, in a broad sense, need to be preached and studied in greater detail. It has happened to me not infrequently to have had to deal with patients in whose lives, loneliness and sorrow, and temperaments in which fears were based on misunderstandings of themselves, had played havoc both with their happiness and their metabolism, yet who had passed through the hands of one or another scientific colleague whose treatment of them, perhaps based on a single physical examination, had indicated a complete color-blindness to the true merits of the case.

It might be too much to expect that every practitioner should have an adequate knowledge of the science that deals with the mental aspects of a person's life and history, but there is good reason to feel indignant when this ignorance is too gross, and especially when those whom it characterizes strive to fill up the gap in their knowledge by scraping together a few arguments to show the uselessness of the facts about which they are so strangely unaware. A recent experience illustrating certain of these points is, in broad outlines, as follows:

A lady of fine, but over-trusting and profoundly neurotic disposition, is on her way home from a distant sanitarium where she had fallen ill with an acute trouble that had been recognized and treated and from which she was convalescent. Having occasion to stop for a brief time at a city within a day's journey of Boston, and feeling still indisposed, she calls in a local practitioner for adviser. In a physical sense there was not much the matter, and not much to be done. That this was the practitioner's opinion likewise is shown by the advice that the patient received from him. He was evidently a kindly person and his counsel was adequate to the necessities of the case. So far so good, though had his diagnosis been more far-reaching he might readily have recognized that without further ado she might return to her native city (which may, indeed, be "provincial," as is sometimes said, but still can boast of a good practitioner or two, and opportunities for making clinical studies of all sorts when these are called for). But no; kindly though he was, he had also a laboratory and was equipped to be a scientific doctor in the most modern sense. The consciousness of this carried its obliga-



tions. He must *prove* himself a modern scientist, a soldier of this lord. And so the drum had to be beaten, the bugle sounded, the skilled assistants summoned to make more than one analysis of the (practically normal) urine, and then to draw an ounce of blood (drawn on both arms), to be used for chemical investigations of the most elaborate sort. Finally the expired air must also be chemically tested by a method which, as we all know, is of the most delicate description, and which was scheduled for repetition in two days.

It is distinctly to be understood that while these tests were going on the patient was not under close observation, and especially that her diet was under no control whatsoever, so that it is not too much to say that from a really scientific standpoint the results of these careful tests could claim no right to scientific standing. The whole procedure was, in short, a hollow mockery, almost equivalent to the playing of a child with a scientific toy of which he had learned the manipulation. On the other hand, by the time the tests were completed the patient was ready to accept anything that was told her, forgetting or not realizing that her life-long history of emotional strain and conflict had not only received no adequate consideration, but had not been recognized as a factor in *her case*, without a deep knowledge of which these weighable and measurable discoveries could be of little note.

Another instance which in a way was much more aggravated than this, has recently come to my attention, where a lady, known to be on her way to an eminently reputable hospital where she was to be under the care of a man of the best possible standing from every point of view, was positively waylaid by a practitioner whom she called in, in a city where she chanced to stop, with the result that she found herself, after a few days, with a bill on her hands for several hundred dollars, a part of which amount was to go, and did go, utterly in vain, into the pocket of a well-known consultant called from another city, while the rest, equally in vain, went into the pocket-book of the practitioner into whose talons she was so unlukey as to fall.

Such experiences as these justly make one feel indignant. They ought to be exposed and thought about, and those who make it their life study to learn what it really means to have a psychoneurotic illness have a right to feel not only dismay but disgust at the practice of colleagues who use knives and pills and instruments of precision, with great freedom, not alone in cases where these are really indicated as of fundamental value, but in others where their employment is due to the fact that they are tools which their owners have learned to use with a skill the possession of which makes them its willing slave.

JAMES J. PUTNAM, M.D.

## THE TREATMENT OF HIP FRACTURES.

Mr. Editor:—

The JOURNAL of September 28, containing the symposium on fractures, has but just come to my notice; and the incentive for this belated intrusion on the discussion of fracture of the neck of the femur is furnished by the following quotations from Dr. Cotton's paper:

"The best way to be sure of a satisfactory result in hip fractures is to have a system and conviction that makes it unnecessary to look up results."

"Now everyone has been claiming everything for his pet method in all hip fractures."

Being fairly familiar with the literature of this subject, I have attempted to identify the pet methods which have set up the wave of enthusiasm that, according to Dr. Cotton, now ruffles a hitherto stagnant pool.

It hardly seems possible that at this late day any one has become enthusiastic over conventional treatment, for even the Maxwell modification has been before the profession for upwards of 50 years. Nor does the characterization seem to apply to Moore's treatment, because that is a modification of the abduction method in adaptation to infirmity. Nor to the non-treatment of Binnie, although Dr. Cotton "understands it has given good results." Nor to artificial impaction, Steineman's nails, ice tongs, or primary bony pegging, because all these are of admittedly limited application.

I am forced to the conclusion that the abduction treatment best represents what Dr. Cotton has in mind, because it is based on conviction, and because very definite claims are made in its behalf.

To specify: It is claimed that fracture of the neck of the femur of whatever type should be treated like any other fracture, by immediate reduction of deformity, by secure fixation of the fragments, and that these essentials of success should be supplemented by the adequate after-care upon which functional recovery is so largely dependent; that such treatment in a comprehensive sense has been made practicable by the abduction method, because it is mechanically adequate for the purpose, as may be demonstrated by x-ray examination at the time of the operation or thereafter that conventional treatment is mechanically inadequate for the application of surgical principles, because its basis is traction which, at best, is unreliable, and, in this instance, usually futile. The chief dependence for security in the treatment of any fracture is the resistance of the apposed fragments. In fracture of the neck of the femur the fragments are in lateral relation and can be brought end to end only in full abduction, when the leverage of the limb is opposed to the resistance of the tense capsule forces; contact and assures security. This is a mechanical proposition that should be self-evident. It is because of the admitted inadequacy of conventional method in the treatment of complete fracture that deformity, seeming to assure contact, is not corrected in spite of the functional disability that it entails.

Dr. Cotton is obsessed by impaction. In his book he states that 90% of hip fractures are impacted. He reviews conventional methods and, with no mention of after-treatment other than that weight should not be borne earlier than eight or ten weeks after the fracture, concludes that the results are good. He has stated elsewhere that: "It is a crime to disturb an impaction in reasonably good position." Furthermore, the fractures at the base of the neck "get well anyhow, with good or bad treatment, while complete intracapsula fractures never unite under routine treatment." I think it is generally conceded that fracture at the base is the common type. Stimson, for example, examined the x-ray pictures of 64 consecutive cases admitted to the New York and Bellevue Hospitals and found fracture at the base in 48, or 75%.

In spite of this potentiality for repair, Cotton now admits, in contrast to his former optimism, that the results are wretched. As I understand his writings he thinks these results are primarily determined by chance,—the chance of fracture at the base or near the head, the chance of impaction or non-impaction,—and that operative impaction alone holds out a hope for a class of otherwise hopeless cases.

The steps in this operation are to reduce displacement under anesthesia; to mallet the adjusted fragments; to fix the limb in a moderate degree of abduction by a plaster spica, and, judging from the illustrative case treated in the Brigham Hospital, to protect the weak part from weight bearing for many months.

This treatment seems to me decidedly mixed. I Dr. Cotton wishes to test the actual resistance of artificial impaction he should treat the patient as, according to his book, he would treat spontaneous impaction and permit weight bearing in eight or ten weeks. Malleting an already injured bone can serve no other



purpose than to fix the fragments. And how can one assure more pressure than by the leverage of an extended and abducted limb against a tense capsule?

It seems to me that artificial impaction is simply a modification of the abduction treatment, and that when Dr. Cotton has mastered the mechanics of the abduction method as a means of correcting deformity and assuring security, which his own writings prove that he does not understand, he will extend rational treatment to those cases that uniting "anyhow" furnish a large proportion of the wretched results that he deplors.

In my opinion, wretched results in favorable cases are best explained by wretched treatment, wretched in conception and wretched in every detail from beginning to end.

The claims of the abduction treatment are based upon its demonstrated efficiency in applying surgical principles. It has never been claimed that all patients are amenable to efficient treatment, or that efficient treatment will always assure success. It is claimed that by efficient treatment one may provide the opportunity for repair without which failure is inevitable; consequently, that the result is determined primarily by the character of the treatment and by the skill and experience of the one who applies it.

The point at issue is not of the possible advantage of pet methods in adaptation to special cases, but of the establishment of surgical principles of which all treatment should conform and of which, at the present time, the abduction treatment is the only exponent.

Dr. Moore's modification of the abduction treatment seems to have succeeded admirably in the class of cases for which it was designed. It has, however, certain practical disadvantages in that it is more difficult to apply accurately and that the attitude designed to permit a sitting posture is less suitable for recumbency. I should suppose, also, that fixing the limb in flexion at the hip and knee would induce contractions that might be resistant to correction.

Dr. Lovett's suggestion that traction should be added to abduction to assure security, based on his experience in the correction of coxa vara, seems hardly pertinent. When a normal bone is broken, one aims to restore the normal contour by apposing the fractured surfaces and thus to assure security. In correction of deformity one must necessarily place the fragments in a new relation which precludes accurate apposition to one another. If the abduction method is properly applied the fragments are locked, the addition of traction is not only unnecessary, but could be a great disadvantage in preventing the frequent changes of position that the independent splint permits.

The abduction treatment has been so often misrepresented by its upholders and critics that I take the liberty of referring those who may care to inform themselves on the subject to the *Annals of Surgery* of October, 1914.

ROYAL WHITMAN, M.D.

13 Lexington Ave., New York City, Nov. 1, 1916.

## NOTICE OF A COMPETITIVE EXAMINATION FOR QUALIFICATION TO THE POSITION OF EPIDEMIOLOGIST IN THE MASSACHUSETTS STATE DEPARTMENT OF HEALTH.

Although the law leaves the appointment of the Epidemiologist in the hands of the Commissioner of Health, it is the policy of the State Department of Health to hold competitive examinations for such positions and to consider the results of such examinations as the principal basis for selecting appointees.

In Dec. 4, 1916, an examination will be held for qualification to the appointment of Epidemiologist of the Massachusetts State Department of Health.

The written examination will be held on the above date in the examination room of the Civil Service

Commission, State House, Boston. The oral and practical examinations will be held on dates and at places announced at time of written examination.

Persons possessing the necessary qualifications desiring to enter the competitive examination for this position are requested to communicate with the State Commissioner of Health, State House, Boston, at once. Upon such written application, a list of rules and regulations governing the appointment, and an application blank will be forwarded.

Admission to the examination is governed by the regulations accompanying this notice. Physical fitness is a necessary prerequisite, but no percentage credits are given on physique. The examination comprises written, oral and feasible practical tests.

A relative rating will be established on the basis of:

- Previous experience in epidemiological work—maximum, 20 points.
- Results of oral examination—maximum, 20 points.
- Results of written examination—maximum, 60 points.

A. J. McLAUGHLIN, M.D.,

November 3, 1916.

Commissioner of Health.

### STATE DEPARTMENT OF HEALTH OF MASSACHUSETTS. REGULATIONS GOVERNING THE APPOINTMENT OF AN EPIDEMIOLOGIST.

#### 1. Number of appointments.

There will be one appointment made to the position of Epidemiologist.

#### 2. Form of application for appointment.

Candidates for the position of Epidemiologist must make application addressed to the Commissioner of Health, in their own handwriting, asking permission to appear before a Board of Examiners. Candidates shall state their age, date and place of birth, present legal residence, names of colleges or institutions of learning of which they are graduates, date of graduation, and shall furnish testimonials as to their experience and moral character.

#### 3. Time limit for applications.

All applications must be on file in the office of the State Department of Health at least ten days before the date scheduled for the examination.

#### 4. Age limit.

No candidates shall be eligible to appear before the Board of Examiners whose age is less than 23 or more than 35.

#### 5. Professional requirements.

Candidates shall be graduates of an incorporated medical school.

#### 6. Citizenship.

All candidates must be citizens of the United States, and preference in appointment will be given to residents of Massachusetts.

#### 7. Physical examination.

Candidates for appointment must pass a satisfactory physical examination before a Board of Examiners.

#### 8. Scope of examination.

All examinations of candidates for the appointment of Epidemiologist shall be conducted by a Board of Examiners. These examinations shall include physical, oral, written and practical tests in the subjects outlined in the succeeding sections.

#### 9. Board of examiners.

The Board of Examiners shall consist of three or more members. These members shall be selected by the Commissioner of Health, from the Public Health Council or other officials of the Department.

#### 10. Subjects for written examinations.

All candidates for appointment must pass a satisfactory written examination in epidemiology, communicable diseases, preventive medicine and vital statistics.



11. *Compensation.*

The compensation of the Epidemiologist shall be \$2,000 per year at the beginning.

12. *Tenure of office.*

The Epidemiologist may be removed from office by the Commissioner of Health because of gross misconduct or inefficiency, but only after the accused officer has been furnished with a copy of the charges made against him and given a hearing thereon by the Public Health Council.

### CHANGES IN THE MEDICAL CORPS, U. S. NAVY, FOR THE TWO WEEKS ENDING OCTOBER 28, 1916.

October 14.

P. A. Surgeon W. H. Connor, detached *Kansas* to *Olympia*.

October 16.

Asst. Surgeon R. M. Waterhouse, to *Melville*.

Asst. Surgeon E. K. Lee, M.R.C., commissioned from Sept. 18, 1916.

October 18.

Medical Director T. A. Berryhill, from Great Lakes Hospital to Mare Island Hospital.

Medical Director M. F. Gates, from Mare Island Hospital to Newport Hospital.

Medical Director L. W. Curtis, from Newport Hospital to Great Lakes Hospital.

P. A. Surgeon I. B. Ledbetter, from Naval Hospital, Las Animas, to Training Station, Great Lakes, Ill.

P. A. Surgeon A. H. Allen, from *Texas* to *Louisiana*.

P. A. Surgeon L. M. Schmidt, from *Louisiana* to Norfolk Hospital.

P. A. Surgeon L. C. Whiteside, to Las Animas Hospital.

Asst. Surgeon R. A. Torrance, to *Texas*.

Asst. Surgeon F. H. Bowman, to *Colorado*.

NOTE: Surgeon J. H. Holloway, retired, died at Albuquerque, N. M., August 2, 1916.

October 24.

Surgeon W. H. Rennie, resignation accepted, effective Nov. 1, 1916.

P. A. Surgeon T. W. Reed, detached Naval Hospital, Norfolk, Va., to Asiatic Station, via November transport.

October 25.

P. A. Surgeon H. L. Kelley, to command Naval Hospital, Port Royal, S. C.

October 28.

P. A. Surgeon S. D. Hart, from Newport Training Station to *Maumee*.

A. A. Surgeon H. A. Giltner, appointed from October 21, 1916, to Navy Recruiting Station, Parkersburg, W. Va.

### SOCIETY NOTICES.

BOSTON SOCIETY FOR MEDICAL IMPROVEMENT.—A meeting of the Society will be held in Sprague Hall, Boston Medical Library, on Monday, November 20, 1916, at 8.15 P.M.

#### PROGRAM

Memorial Addresses, "Dr. William P. Rolles,"

Dr. Charles F. Withington

Dr. Edward Waldo Emerson

Paper on "Sanatoria," Dr. Edward L. Parks

9.00 P.M., Business Meeting.

Question: The Future of the Society.

Every member is urged to be present.

GILBERT SMITH, Secretary.

59 Commonwealth Avenue.

SUFFOLK DISTRICT MEDICAL SOCIETY.—A regular meeting of the Surgical Section will be held at the

Boston Medical Library on Nov. 22, at 8 P.M.

1. Dr. F. B. Mallory, Boston, "The Pathology of Acute Pancreatitis." (With lantern slides.)

II. Dr. John B. Deaver, Philadelphia, "The Surgical Aspects of Pancreatitis." (With lantern slides.)

The discussion of these papers will be introduced by Dr. Joseph H. Pratt and Dr. Franklin G. Balch, Boston.

W. J. MIXTER, M.D.,

Secretary.

CHARLES L. SCUDDER, M.D.,

Chairman.

### APPOINTMENTS.

MASSACHUSETTS STATE DEPARTMENT OF HEALTH.—Dr. Walter H. Brown, epidemiologist of the Massachusetts State Board of Health, resigned his position on November 1, to accept an appointment as executive officer of the board of health of Bridgeport, Conn.

NORTHWESTERN UNIVERSITY.—Dr. Frederic A. Besley has been appointed professor of surgery and Dr. Roy G. Hoskins, associate professor of physiology in the Northwestern University Medical School.

UNIVERSITY AND BELLEVUE HOSPITAL.—Dr. P. Y. Previc has been appointed instructor in physiology, and Dr. E. R. Hoskins and Dr. J. L. Connel, instructors in anatomy at the University and Bellevue Hospital Medical College.

UNIVERSITY OF ILLINOIS.—Dr. L. V. Heilbrun has been appointed instructor in microscopic anatomy at the College of Medicine at the University of Illinois.

UNIVERSITY OF NEBRASKA.—Dr. H. E. Eggers has been appointed professor of pathology and bacteriology, Dr. Amos W. Peters, assistant professor of biochemistry, and Dr. John T. Myers, instructor in bacteriology, in the College of Medicine of the University of Nebraska, Omaha.

MCGILL UNIVERSITY.—Dr. Ardrey W. Downs, formerly professor of physiology at the Medico-Chirurgical College, Philadelphia, has been appointed professor of physiology at McGill University, Montreal.

UNITED STATES HOSPITAL, Manila.—Dr. Fernando Calderos has been appointed director of the United States Government Hospital at Manila in succession to Dr. William E. Musgrave, professor of surgery, and dean of the Medical College of the University of the Philippines.

HARVARD UNIVERSITY.—Dr. Charles L. Scudder, formerly lecturer on surgery, has been appointed assistant professor of surgery in the Harvard Medical School.

### RECENT DEATHS.

DR. LEONARD M. BRADLEY of Milton, Mass., who died at Mattapan, Mass., recently, was born in Milton on March 6, 1879, and had practiced his profession as a dentist in Mattapan for a number of years. He is survived by his widow and one son.

DR. LEWIS DARLING, who died recently at Lawrenceville at Tioga County, Pennsylvania, was born there on Oct. 19, 1840, the son of a physician. He received the degree of M.D. in 1866, from the University of Michigan, after having served throughout the Civil War. He immediately settled in his native town, where he continued in the practice of surgery until his death. He is survived by his widow, three sons and three grandsons.

DR. FRANK D. MAINE, who died on October 29, at Springfield, Mass., was born in 1839. He served throughout the Civil War as a volunteer in the Fourteenth Connecticut Infantry, and after teaching for a time, obtained the degree of M.D., in 1872, from the New York Homeopathic Medical College. After practicing his profession successively in Middletown and Windsor Locks, Connecticut, he removed, in 1892, to Springfield, where he continued active in the profession until his death. He is survived by his widow.



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## Address.

### THE PHYSICALLY DEFECTIVE.\*

BY EDWARD O. OTIS, M.D., BOSTON.

WHETHER any of us are mentally perfect is a question, for as Tuke, the great English authority on mental diseases, remarks, it is to be assumed that the deity is sane, but whether anybody else is is a debatable question. At all events, most of us have some kind of a mental bias. Morally, we confess that we are all "miserable sinners"; physically, we are no less imperfect. "There is always somewhere a weakest spot." However, that "weakest spot" does not, with the majority of men, incapacitate them for a man's career in the world. It is only some marked and glaring physical deviation from what we call the normal that places one in the category of the physically defective, and this class is what we have to consider.

Mind and will always triumph over matter, and when the will power is intelligently directed and grimly determined, it will make a defective body do its bidding. Illustrations of this are innumerable, and all of us can doubtless recall examples in our own experience of success attained in spite of physical handicaps. Henry Fawcett became blind through an accident at the beginning of his career, yet later he became professor of political economy at Cambridge University, a writer upon the subject, a member of Parlia-

ment and postmaster-general of England. Huber, the blind naturalist, contributed to entomological science some new observations upon the habits of the bees. It was Milton's blindness which gave us that matchless poem, so sad and yet so triumphant:—

"When I consider how my light is spent  
Ere half my days in this dark world and wide,  
And that one talent which is death to hide  
Lodged with me useless. . . ."

The remarkable development of Helen Keller is familiar to us all. One of our own United States Senators is blind, and an eminent member of our own profession, who has added much to medical literature, has suffered from the same misfortune since youth. Even our friend Silas Wegg, with the handicap of his wooden leg, made the most of his opportunity and won temporary distinction as an educator of the credulous Mr. Boffin.

The men and women, however, who have achieved marked distinction in spite of acquired or congenital physical defects are the exception. Besides the will to succeed and an exceptional mind, they usually enjoyed exceptional opportunities for education. Not so with the great mass of the physically defective. Like the rest of us, they are of mediocre mental inheritance, and a large majority are without means of education, or opportunity of development, unless some assistance is rendered them. Such are the blind, the deaf and dumb, the crippled and deformed, and those suffering from various other physical handicaps. It is, indeed, bewildering, as well as depressing, to consider the vast numbers of this

\* Presented at the meeting of the American Academy of Medicine, at Detroit, June 10, 1916.



kind which the present war is producing at wholesale.

Granted that the physically defective are of sound mind, there is much to be hoped for in their care and education, as experience has shown; the "lame man may not leap as an hart, or the eyes of the blind be opened, or the ears of the deaf be unstopped, or the tongue of the dumb sing," but many, perhaps the most, can be expected to become self-supporting or more; they can be trained to employ the faculties that remain to the best advantage, and thus discount their handicaps.

The legitimate duty of the state is to provide for the welfare of its people,—all its people; and each state must decide in what way and how far it will and can do this. Two fundamental objects, however, are obviously the duty of every well-ordered state: first, to protect its citizens from palpable injurious influences, such, for example, as contagious diseases, impure food and drink, unwholesome conditions in factory and workshop, exploitation of child labor, etc.; hence the free distribution of diphtheria antitoxin, compulsory vaccination, milk and food inspection, the notification of contagious diseases, hospitals for consumptives, etc. Second, to afford its citizens an opportunity for development, a chance to realize that freedom, equality, and pursuit of happiness which are declared to be the birthright of us all in this country; hence the public schools and libraries, and other public educative measures. Furthermore, the public has, to a greater or less degree, taken upon itself the duty of caring for many of its unfortunates in mind or body, both for their own good and also to prevent them from being a source of injury to others, or from becoming dependents; hence the public hospitals and insane asylums, institutions for the feeble-minded, consumptive sanatoria, reformatories for the criminal class, schools or institutions for the crippled and deformed, the blind, and the deaf and dumb.

It is of the three latter classes of physical infirmities that I wish especially to speak, namely: (a) the crippled and deformed, (b) the blind, (c) and the deaf and dumb, for they constitute the major part of those whom we include under the physically defective and for whom legislation has done much, particularly for the blind and the deaf and dumb. For the crippled and deformed the states do not appear to have made equal or adequate provision, although this class probably largely outnumbers the other two classes. "It may be stated in general," says the Secretary of the State Board of Charities of Massachusetts, "that public care of crippled and deformed children, who are not necessarily public dependents, is the rare exception rather than the rule in social development." We still see, all too frequently, the maimed or crippled man selling lead pencils or shoe strings on the street corner, who, with an industrial education, might be setting type or cane-seating chairs and earn-

ing a steady and not a half-begging, precarious income. How much more inspiring is it to undertake the education of a crippled child with a sound mind than to expend the same amount upon a feeble-minded one, who can never be anything but a burden upon the community! How many crippled children and adults there are in the United States no one knows, for, unfortunately, no census of them has ever been taken. Dr. Orr of the Nebraska Orthopedic Hospital estimates the number as 259,000. Prof. Lange, quoted by Miss Reeves,\* stated in 1910 that the number of crippled children under fifteen years of age in Germany was 98,263. One hardly dares to imagine what the number of crippled and maimed adults now is in that unhappy country, which is so rapidly producing them. "If the number of crippled children in this country," says Miss Reeves, "bore the same proportion to the general population as in Germany, there would be about 133,000 crippled children under fourteen years of age, and at present only 4901 are cared for in the 37 existing institutions for them, public and private."

It is evident, then, that a not inconsiderable number of such children, indeed the greater number, are growing up illiterate and without training, owing to their inability to attend the common schools. It would appear to be a duty, as well as an economic measure, for the state to afford these defectives a common school and industrial education, and thus render them self-supporting members of society instead of a burden upon it. There are only five institutions for crippled and deformed children maintained entirely by state appropriations: one each in Massachusetts, New York and Nebraska, and two in Minnesota. Some of the other similar institutions receive public aid, but are controlled and administered by private boards. The "Massachusetts Hospital School" is the largest and most elaborate of its kind in America, and has a capacity for 250 children from five to fifteen years of age who are "mentally competent to attend the public schools." It was established in 1907 by a state appropriation of \$300,000, and the annual maintenance expense at the present time is \$80,000. Besides indicated surgical treatment, the children are given a common school and industrial training. As stated in the act establishing the school, "the purpose (of which) shall be the education and care of the crippled and deformed children of the Commonwealth." Industrial training is given in household arts, sewing, and handicrafts, such as basketry, printing, tailoring, cobbling, carpentry, etc. "The results achieved," says Miss Reeves, "through vocational training evolved from the daily life of a large institution, are most strikingly seen here and at the Widener Memorial School." This latter, the Widener School, is a residential institution, and is probably the most

\* "Care and Education of Crippled Children in the United States," by Edith Reeves, Russell Sage Foundation, N. Y., Survey Associates, etc., 1914.



perfect of its kind in the world, both in the perfection of its plant and in its large endowment of four million dollars.

The New York Hospital for Ruptured and Crippled is a similar institution of the highest development and efficiency, at which graded school work and vocational training are afforded for the deformed children, the City Board of Education paying a certain sum per year for each pupil.

Besides those mentioned above, there are some thirty other institutions of a more or less analogous character, principally established and supported by private charity. Some are called hospitals, some asylum homes, some convalescent hospitals or homes, and others schools; in most of them there is more or less educational work and vocational training.

The greatest need, Miss Reeves found in her investigation, was for children in rural communities, and the only institutions that were adequately meeting this need were the state institutions of Massachusetts, New York, Minnesota and Nebraska.

Besides the residential institutions for the crippled and deformed children, there are day schools, either private or public. In some of the larger cities, as in Chicago, New York, Cleveland and Detroit, special departments or classes are provided in the public schools for such children. The Boston Industrial School for Crippled and Deformed Children is a notable example of a highly-developed day school for such defectives. In this institution, which consists of one large building for general use, and I refer to it especially as it is in my own city and I am familiar with its work, there is a primary and grammar school department, similar to those of the public schools; and manual training adapted to those grades, including paper-folding, clay modeling, basket-making, sloyd, cane-seating, cobbling, needle-work, cooking, typesetting, and printing. Most of the pupils are conveyed to the school and returned to their homes daily, and all receive a substantial dinner at noon. There are also trade classes for those over fifteen years of age, and as soon as they become proficient these workers receive pay. Connected with this school is a modern outdoor schoolroom for those suffering from deformities of a tuberculous origin. Adjustable desks and special seats are provided, cots for rest periods and special gymnastic training are given. A nurse is constantly in attendance, who also visits the children at their homes. There is also medical, surgical and dental supervision and care.

It is evident that state legislation needs to do far more for this hopeful class of young defectives than yet has been done, for, as has been noted above, only about 5000 are at present cared for. Apparently the crippled and deformed do not seem to make quite the appeal to one's sympathies as do the blind or the deaf and dumb.

For the class of indigent adults who are phys-

ically defective from such diseases as arthritis, paralysis, cardiac disease, syphilis and other incapacitating conditions, the state almshouses or workhouses are the common public provision, and all states provide such accommodations, some better, some worse. Private charity also supplements the state provisions by various homes and hospitals, such, for example, as the great Robert B. Brigham Hospital for Incurables, in Boston, with a liberal endowment.

The loss of one of the senses, like that of sight or hearing, seems such an incomparably greater misfortune than to be crippled or deformed, that one's sympathy and pity are more strongly aroused towards this unfortunate class. To be forever shut out from the sight of all the objects of beauty and interest in the world, or never to hear the sound of a friend's voice or the Largo of a Handel is indeed an appealing misfortune, and hence it is that the public early expressed its sympathy in a practical form and began to make provision for the education and training of the blind and the deaf of school age, so that at the present time every state either has its own institutions for the education of those bereft of one or the other of these two senses, or else, as in the case of the smaller or sparsely populated states, makes arrangements for their education at public expense in neighboring states.

As the census report of 1910 upon "Benevolent Institutions" says: "There is probably no one class of persons for whose education and training such complete provision is made as for the blind and deaf." At the twelfth census, an investigation conducted by Dr. Alexander Graham Bell showed that there was a minimum of 64,763 blind persons in the United States, and of these somewhat over half were totally blind and 8000 were under twenty years of age. According to the report of the Commissioner of Education for 1908 there were forty state schools for the education of the blind, with 4340 pupils, and the census of 1910 shows 4720 in such institutions. The education of these children is not regarded as a charity, but as a part of the educational system, carried on at public expense. In 1879 Congress appropriated \$250,000 as a perpetual fund for the purchase of books and apparatus for the different state schools. Normal schools for the blind are also maintained in some states. The first school for the blind established in this country was a private enterprise, that of the Perkins Institute in Boston, founded in 1829 and rendered famous by its two great directors, Dr. Samuel Howe and Dr. Anagnos, and by the remarkable work of the former in the education of Laura Bridgman, who was deaf, dumb and blind. With infinite patience and devotion, Dr. Howe succeeded in unlocking the mind of this poor deaf mute until she became mentally alert, and developed into a well-educated woman.

Soon after the founding of the Perkins Insti-



tute, those at New York and Philadelphia were established in 1831 and 1833, respectively; and then, as the duty of the public towards these defectives began to be recognized, came the state institutions, which now exist in nearly every state.

The education given is at first similar to that of the ordinary common school, accompanied by manual training and gymnastics. Special training is also afforded in some handicraft, or for some professional or business occupation, according to the talent and ability of the pupil. Music and pianoforte tuning have been found peculiarly adapted to the blind, and some have attained eminence in the latter, as, for example, John Stanley, who was an organist at the age of eleven. The aim in the education of the blind is, first, to establish hope, the hope that in spite of their grievous handicap, they can attain a man's standing in the world, for hope stimulates endeavor; second, to give them a general common education; and third, a practical or technical education so that they may become self-supporting. It speaks well for the altruistic spirit, and as well for the economic sagacity of this country that it is so fully and liberally accomplishing this self-imposed task.

Culture and humanity are not necessarily close companions. We still seek philosophy from Plato and culture from ancient Roman literature; but it was a custom of both Greeks and Romans, to throw their deaf into the river and destroy their defectives,—a rather merciless eugenic method of ensuring a sturdy race. The deaf were regarded as being in the same class as idiots. Saint Augustine declared that the deaf could have no faith, since "faith comes by hearing only." A century ago even, the deaf were practically outside of human thought and activities, and for a long time were regarded as an exceptional class, like the peculiar silent folk Rip Van Winkle encountered in the mountain hollow. Various legal enactments were made indicating this attitude towards them, such as exemption from poll and other taxes; forbidding them from making wills, unless their intention was declared in writing; the appointment of guardians for them, etc. As time went on, however, and civilization advanced, it was found that these people of silence were mentally sound, and by education could be developed into rational beings.

At the beginning of the last century schools for the deaf began to be founded on the Continent and in England, and in 1816 Gallaudet established the first school for the deaf in America, at Hartford, called the Connecticut Asylum. At the present day, liberal state provision is made for the education of the deaf and the deaf and dumb, and after they have received their education they are regarded as are any other members of society, and are considered able to look after themselves. As wage earners they compare well with the average of the rest of the

population. According to the census of 1910 there were 43,812 deaf persons in the United States, 90% of whom became deaf before the twentieth year, and nearly three-fourths under five years of age. From three-fifths to two-thirds are caused by accident or disease, mostly from the latter, of which scarlet fever and meningitis are the most frequent causative factors.

In every state except New Hampshire, Nevada and Wyoming there are public institutions for the education of the deaf, and these three excepted states, on account of their small population, make provision at public expense for their deaf in other state schools. Some states have more than one such school. It can be said that every deaf child in the United States under twenty-one years of age is now given the opportunity of an education and afforded maintenance in a state institution. In a few of the Eastern states the institutions are in private hands but receive state assistance and are subject to public supervision. In ten states there are dual schools for the deaf and blind.

W. H. Addison of the Mosely Commission of England, who visited this country in 1907, testifies that "the care and instruction of the deaf seems everywhere to be regarded as one of the first duties of the state, and in the equipment of her schools for the deaf, America far surpasses Great Britain."

At the close of the year 1910 there were 10,543 inmates of deaf and dumb institutions, of which 5712 were able to speak, and 4831 were dumb. Of the whole number, 7054 were children, and of these 4172 were able to speak.

The two methods of teaching the deaf, as we know, are the sign and the oral methods, or a combination of the two. This education is not cheap, for it costs the state eight times as much to educate its deaf children as its hearing ones in the regular public schools, and four times as much in the day schools.

Besides the state institutional schools, in which about five-sixths of the deaf children are educated, there are day schools, which are a part of the public school system. These exist principally in the large cities, as in New York, Chicago, Boston and elsewhere. One of the first schools of this kind was the Horace Mann School, established in Boston in 1861. There are now in all sixty-five such schools. It has been found, however, that better results are obtained in the institutional or boarding schools, where the children reside continuously, than in the day schools.

In addition to all the states are doing for the deaf, Congress established at Washington in 1857 a college for the deaf and dumb, now united with the Gallaudet College and called the Columbia Institution. This is wholly supported by the Government.

A few of the aged and infirm deaf are found in the almshouses, but the total number is a little over 1%, thus showing that the great majority



of the deaf form a self-supporting part of the community and engage in almost all the various occupations and many of the professions.

Ancillary to the problem of the deaf and blind, is the medical examination of school children, by means of which these distressing defects in sight and hearing may, in some cases at least, be prevented: for by the early detection of infantile and infectious diseases, which are a prolific cause of deafness and blindness, and by timely treatment, such ultimate evils may be avoided. In Massachusetts the law requires the examination of the eyes and ears of the school children in all cities and towns of the state, the State Board of Education furnishing the test.

Another great class which may, I think, be included under the physically defectives are the tuberculous, although, of course, this incapacity is not always permanent, and the aim in the wide public provision made for them is not only treatment and care, but prevention. Quite every state has established one or more sanatoria for such sufferers and maintains them at public expense. The public appropriation for this purpose last year (1915) was \$14,500,000, and of this sum four states—New York, Pennsylvania, Illinois and Massachusetts—contributed over eight million dollars. Besides the sanatoria, special tuberculosis dispensaries are maintained by some states, as in Pennsylvania. In Massachusetts all cities of 10,000 inhabitants are required by law to establish and maintain such dispensaries. Municipalities, in many instances, maintain similar institutions under their boards of health, and likewise open-air schools or school rooms for the children with evidence of latent tuberculosis.

Besides sanatoria for supposedly curable cases of tuberculosis, consumptive hospitals for the incurables have also been established in some states, generally through local instrumentality, but with public supervision and state aid in maintenance. In Massachusetts the law requires all cities to establish such hospitals, and also towns when requested to do so by the State Board of Health. Municipalities have also taxed themselves to provide consumptive hospitals for their indigent incurables. Chicago, by the mill tax upon all taxable property of the city, has erected a great institution, which will provide for nearly a thousand patients. Boston has expended over a million dollars upon its Consumptive Hospital, and is constantly enlarging it. So of other cities. It is now proposed that by an act of Congress a special division of tuberculosis should be established in the United States Public Health Service, with an adequate appropriation, for the study and investigation of the tuberculosis problem. Thus it will be seen that legislation is actively engaged throughout the country in providing for its physically defective through tuberculosis.

Another incapacitating disease which in recent years has grown to large proportions is that

of the heart. For example, in New York in 1914 the deaths from heart disease increased from 74 to 169 per one hundred thousand, and other cities have had a similar experience. As with the child with latent tuberculosis, so with the child with slight or latent cardiac disease. Especial care in its education is equally necessary, and especial vocational training, so that it may learn an occupation adapted to its damaged heart. The wage-earner, likewise, with cardiac disease, would seem to deserve the same consideration as the tuberculous wage-earner. It would appear, therefore, that in the near future some public recognition and provision should be made for this class of defectives, if they continue to increase in the future as rapidly as in the past.

From the above it will be seen that the public in this country provides liberally for its blind, deaf and dumb, but very inadequately for its crippled and deformed, although the latter class outnumbers that of the two others combined. One cannot hope to make the lame man "leap as a hart," but by proper education his mind may be rendered alert, and by training the defective members made to do useful service.

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## Original Articles.

### FRACTURES IN A BASE HOSPITAL.

By FREDERICK A. COLLIER, M.D., LOS ANGELES, CALIF.

(From the American Women's War Hospital, Paignton, England.)

THE American Women's War Hospital was opened in September, 1914, and in the course of 19 months from that time, till April 1, 1916, it has treated and discharged 2350 patients. It may be accepted as a typical base hospital, and the class of cases as typical of those cared for in all base hospitals, except a certain few of a specialized type. The cases treated are both medical and surgical; the total number of discharges comprised 836 medical cases and 1514 surgical cases, the large majority of the latter being wounded. Of this latter group, there have been 310 cases with fractures of one or more bones, or roughly, the cases with fractures comprised about one-fifth of all the surgical cases. A number of these cases presented more than one fracture problem, making a total of 327 fractures requiring treatment. In this list are included fractures of the skull, maxillæ and ribs, solely with the idea of showing the proportion of fractures occurring in these bones as compared with those in the rest of the skeleton, and the treatment of them will not be considered in this



paper except in a most general way. Their proportion in the following classification, however, is not a true one, as more recently there have been established special hospitals for the treatment of these groups of cases, and any which come to a base hospital arrive only through some oversight on the part of the transportation authorities.

Of these 327 fractures, 40 were simple and 287 compound, the latter caused by a missile of warfare in every case. In Table I a detailed list of the bones involved is given, the arrangement showing fractural entities as they occur. If we include the small bones of the hands and feet, we find that there are 159 fractures in the upper extremity in 113 in the lower; excluding these, however, we find that the number of fractures in the long bones is nearly the same in the two extremities,—90 in the lower and 85 in the upper,—the larger number of injuries to the hands than to the feet causing the difference when the entire extremity is considered.

TABLE I.

	Compound.	Simple.	Total.
Skull .....	22		22
Spine .....	2		2
Maxillae .....	11		11
Ribs .....	7	5	12
Clavicle .....	2	1	3
Scapula .....	4		4
Scapula and Clavicle .....	3		3
Humerus .....	33	6	39
Humerus and Ulna .....	4		4
Ulna .....	17	1	18
Radius .....	12	5	17
Radius and Ulna .....	4	1	5
Radius and Carpal .....	2		2
Carpals .....	3		3
Metacarpals .....	28	2	30
Metacarpals and Phalanges .....	6		6
Phalanges (fingers) .....	33	2	35
Femur .....	27	1	28
Patella .....	2	1	3
Tibia .....	20	2	22
Fibula .....	10	5	15
Tibia and Fibula .....	17	5	22
Tarsal and Metatarsal .....	4		4
Tarsal .....	2	2	4
Metatarsal .....	9	1	10
Phalanges (toe) .....	3		3
327	40		327

**Missiles.** The compound fractures were caused by the following projectiles: 152 bullets, 86 shell fragments, 23 shrapnel balls, 9 by grenades or bombs, and not determined in 17 cases. The bullet wounds were perforating in 143 cases, the bullet lodging in 9 cases. The shell wounds were perforating in 64 instances and non-perforating in 22 cases. The grenade and bomb wounds were non-perforating and were marked by the multiplicity of fragments, in one instance 170 pieces of bomb being removed. In two cases of fractured femur in which the bullet lodged, there was a fine disintegration of the bullet after impact; this was observed only in the cases mentioned. In most of the perforating shell wounds, although the large

fragments had perforated, there were many smaller fragments of steel remaining in the wound, and in the perforating wounds caused by shrapnel balls, the course of the ball could be traced by the spattering of lead. The comparative velocities of the various missiles may be shown in a relative way by the frequency with which they lodged, varying from about 6/10% in the bullet, 25% with shell fragments, and 36% with the shrapnel ball, to nearly 100% with grenades and bombs. All projectiles that had lodged were removed except two bullets; one of these had remained in the head of the femur, and it was thought best not to attempt its removal at the time, but we have since ascertained that he has had a persistent synovitis of the hip joint since leaving the hospital, enough to incapacitate him, and viewed in the light of this history it would have been wiser to have removed the bullet. The second case was one in which the bullet lodged in the muscles of the back after perforating the arm, and has given rise to no symptoms. In many cases small fragments of shell were left *in situ*, although the main piece was removed and the wounds healed in every case.

**Infection.** In the 287 compound fractures there were 44 in which healing took place without infection, and 243 cases with sepsis of varying grades present. Of those wounds remaining clean, 30 were caused by bullets, 13 by shell and 1 by shrapnel ball, all wounds being perforating. The clean bullet wounds were those caused in the zone of perforation and showed the characteristic small, punctured, sealed wounds of entrance and exit; the clean shell wounds were all caused by small bits of shell casing, apparently never larger than 1 cm. in diameter, and had sealed wounds of entrance and exit. The single wound from shrapnel ball, in which aseptic healing took place, occurred in the arm, the fracture being an oblique one of the humerus, the ball glancing from the bone, and the wounds of entrance and exit being small and sealed. Of the infected cases, 238 were pyogenic infections caused by the staphylococcus, streptococcus, in many cases of an attenuated variety, B. pyocyaneus and members of the colon group. In the majority of the pyogenic infections the sepsis was of a low-grade nature, with a tendency to become chronic, with indolent granulations and sinus formation. There were only 5 cases from which the B. perfringens was isolated, but a routine culturing of wounds has been done only during recent months, and undoubtedly there have been many wounds from which the gas bacillus could have been isolated, but only in the 5 cases mentioned have there been any clinical signs of the organism. All were cases with extensive lacerated wounds with much destruction of tissues; crepitation, marked swelling and typical thin dirty grayish pus were present. Amputation was necessary in one case, the others recovering after free in-



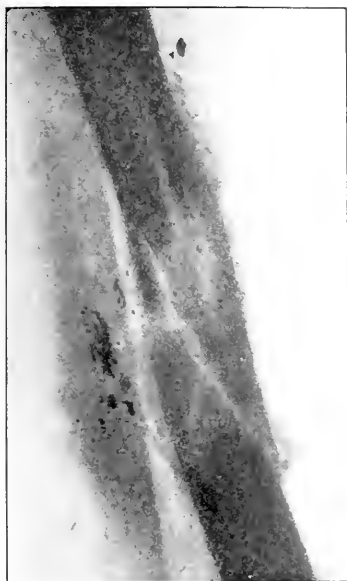


FIG. 1.—"Butterfly" fracture of humerus from shell fragment, one week old.

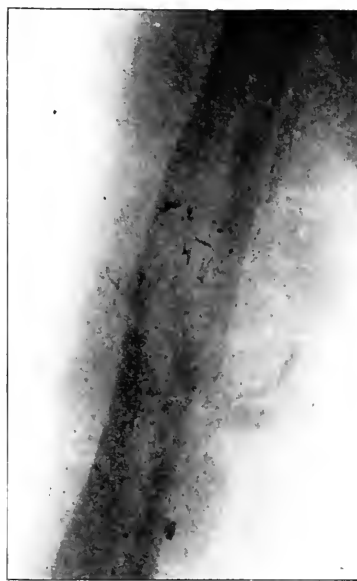


FIG. 2.—Same as FIG. 1 four weeks later. Union firm with small fragments of shell in callus.

cision and drainage. The small number of grave infections may be accounted for in part by the fact that the cases are not transported until all virulent sepsis has subsided, the man usually being kept in some of the general field hospitals till he is deemed fit to travel. In all cases we have made a careful record of the length of time intervening between the times of injury and first dressing, the dressing in some more permanent hospital, and up to certain limits we have been unable to discover any relation between the virulence or absence of sepsis and the time intervening between reception of injury and application of dressings. Up to 12 hours the records showed nothing, but with longer lapses than this before any dressing was applied, the sepsis seemed to be more virulent, and in a certain small number of cases which did not receive a dressing for two or three days there was a decided increase in the severity of infection. However, this may be partly, if not wholly, accounted for by the fact that these cases were usually exposed without food or covering, with an attendant marked lowering of the general resistance. About 40% of the cases received their first dressings within less than 5 minutes; about 40% from this time up to 3 hours, and the remaining 20% from 3 hours up to several days. Of course no elaborate deductions can be made from this small number of cases, but in this series we found that the degree

and amount of sepsis was dependent on the character of the wound, the conditions under which it was received, and on the missile causing it, rather than on the character of the first dressing or the time when it was applied.

*Character of Fractures.* There were 12 incomplete fractures of the long bones, 7 grooving, and 5 perforating. The perforating fractures were caused, 3 by bullets and 2 by fragments of shell, and all occurred in the expanded spongy portion of the bones, 2 in the lower end of the femur, 2 in the upper end of the tibia, and 1 in the lower end of the radius. The types of fracture were usually of the classical varieties described, and those seen most frequently will be briefly enumerated. The fractures of the long bones by bullets were roughly divisible into three groups, those caused by perforation at short ranges giving the so-called explosive effect with the production of very fine comminution, the fragments being driven in the direction of the lines of force and scattered in the tissues between the bone and the wound of exit; there was practically no splintering or fissuring and the effect was more localized than one would expect. This type resulted in several cases in non-union, with a pronounced gap between the bone ends. It is associated with extensive wounds of the soft parts, especially the wounds of exit, and when infected the bone fragments lie exposed at the bottom of this open septic wound, and unite only under these most adverse





Fig. 3.—Double fracture of humerus. The upper caused by bullet at close range, compound with comminution. The lower a closed oblique fracture at some distance.

circumstances. This type of wound is shown in Figs. 5 and 10. The second type is caused at longer ranges in the zone of perforation, the bullet causing a characteristic fracture with fissures radiating from the point of perforation and the size of the comminuted fragments governed by the angles of these fissures, giving the so-called "butterfly" fracture. Fig. 1 shows this type, while Fig. 12 shows the fissuring present in a perforation at still longer ranges; these usually show very little deformity and good alignment. A third type resulted from impact of the bullet at terminal ranges, in the zone of confusion, causing fractures by contact; these were marked by the large size and small number of the fragments, and in most cases were oblique fractures with practically no comminution. The shrapnel balls having a comparatively low velocity caused fracture varying between the last two mentioned types, the oblique or a simple form of the butterfly fracture predominating. In neither of these types did the bone experience any loss of substance, and most of the fragments retained their periosteum. The fractures due to shell fragments were of all types, varying with the size, shape, velocity and angle of impact. They varied from simple perforations without loss of continuity to badly comminuted fractures with much loss of bone substance, and were often accompanied by large lacerated wounds with marked destruction of soft parts. In general, the fractures by shell

were marked by less severe bony destruction and greater damage to soft parts, the fractures by bullets showing greater bony destruction and less severe lesions in the soft parts. There were three cases in which simple fracture at a distance, caused by indirect violence, accompanied the compound fracture caused by direct violence. Two were of the humerus, the first a finely comminuted fracture of the shaft adjacent to the neck with a simple slightly oblique fracture of the shaft at its middle, shown in Fig. 3; the second was similar except the direct fracture was of the drill variety and incomplete, close to the joint, while again the simple indirect fracture was about the middle of the shaft. The other was a simple oblique fracture of the femur through the shaft just above the condyles, accompanying a fracture of both bones of the leg in their middle third. There was no history of fall or other accompanying injury. The first two were caused by bullets and the last by a shell fragment.

*Treatment.* The average time elapsing between time of injury and entrance to hospital in all cases was 15 days, but this is not a fair general average because it was raised very much by two convoys coming from the Mediterranean forces, most of whom were wounded at least a month before entrance, and one of them had been wounded three months previous to arrival. Usually the cases reach us about 7 or 8 days af-



Fig. 4.—Contact fracture of tibia by shrapnel ball. Ball has entire one half still in contact with bone. Typical symmetrical lines of fracture.





FIG. 5.—Bullet wounds of forearm inflicted at close range, in the explosive zone. Small wound of entrance and large wound of exit. Four days old.

ter the injury. If, however, there was any large number of casualties, they are brought to us much sooner, reaching the hospital 48 hours after being wounded; one convoy reached the hospital 24 hours after the engagement.

The treatment may be roughly divided into two phases,—that received before admission, which consists principally of the treatment of early complications, virulent infection, secondary hemorrhage and shock, with the fracture receiving secondary consideration; the second phase comprising that treatment received after arrival in a base hospital, where the fracture receives primary consideration and complications



FIG. 7. Fracture of humerus by a bullet in the explosive zone showing free comminution which is sharply localized, a tendency toward formation of gap between bone ends and absence of fissuring.



FIG. 6. Radiograph of forearm showing absence of substance in radius.



FIG. 8. Radiograph of forearm showing absence of substance in radius.





FIG. 9.—Wound of entrance caused by fragment of hand bomb perforating forearm.

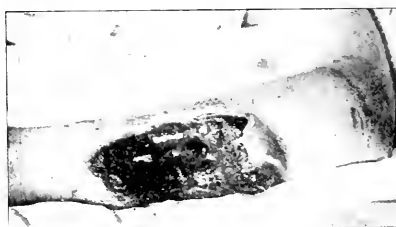


FIG. 10.—Wound of exit in case shown in FIG. 9.



FIG. 11.—Radiograph of forearm of the case shown in FIGS. 9 and 10. Shows great loss of substance of ulna.

are treated as they arise. The soldier receives his first-aid dressing as soon as possible after being wounded; this formerly consisted of an aseptic dressing, but more recently most of them are antiseptic in character, of a larger dimension than before. A few moments later in the dressing station, he is given another dressing, the wound is painted with iodine, anti-tetanic serum is given and fixation applied to the fracture. He is then transported through the routine of field hospital, casualty clearing stations, and ambulance train, to a general stationary hospital. Complications are treated as they arise, while passing through any part of this routine, by drainage, ligation, opiates and dressings. A serious case may remain at any point when deemed advisable. At the stationary hospital more permanent fixation is applied, drainage established for sepsis, and the patient is given an opportunity to recuperate. When deemed fit to travel, that is, when virulent sepsis has abated and adequate fixation applied, he is transported to the base hospitals in England.

The patients are transported in a variety of splints, most of them being made of wood and of a simple pattern. Some of the most common are the Thomas splint for femurs; a modification of this is often used for the humerus, wooden right angles for fixation of the elbow and simple wooden splints with foot rest for the leg. If the wound is inadequately drained, or when there is reason to believe that it has been imperfectly cleaned, the case is immediately operated upon, adequate drainage made, all fragments of missiles and clothing removed, the fracture reduced, and some apparatus applied that will give adequate fixation and at the same time allow the necessary dressings to be done. Missiles are removed at this time if they are readily accessible, and if no uninfected tissue has to be opened up in order to gain access to them. A greater effort is made to find shell fragments and shrapnel balls at this time than bullets, as they undoubtedly carry in enough clothing to render them a focus of infection. If the missile is not removed at this operation, it is removed after the sepsis has partly cleaned up, provided it is causing trouble of any sort; if not, it is left alone, but, as our records show, it has been thought advisable to remove most of them sooner or later. The principal septic focus is usually located between the bone and the wound of exit, along which track the fragments of bone are scattered, and it is here the principal drainage is placed. As regards the treatment of bone fragments, we have become more and more conservative about their removal. Fine fragments, loose in the tissues and bearing no relation to the correct alignment of the bone, are removed. Larger loose fragments, from which the periosteum has been stripped, are also removed, but all other fragments, that have at least a partial periosteal covering and any muscular attachment, are pushed back into rela-



tionship with the line of the principal fragments. If any sharp spicules are present on fragments adjacent to vessels, they are cut away. Occasionally the small fragments may extrude themselves later or their removal becomes necessary, but in case after case, one may see callus formation greatly assisted by the proliferation from these small fragments of bone, and in several cases a pronounced gap was entirely filled in by bony growth from these small fragments, as is shown in Fig. 8. The viability of these fragments, of course, depends a great deal on the virulence of the infection, but that they will live and proliferate in the presence of a pronounced sepsis there is no doubt. In fact, it would seem that these severely comminuted fractures offer particularly favorable conditions for early and solid union, since it has been shown by McEwen that the osteogenetic power of bone varies inversely with its volume.

For drainage we have used rubber or gutta percha strips in all cases, using in addition a soft rubber tube of small caliber for irrigation and for instillations of hypochlorous acid after the method of Carrel and Dakin. All drains are shortened and removed as early as possible, as it was found their prolonged use favored the formation of sinuses. Prolonged drainage is seldom necessary if the original incisions are properly made.

Plaster has been our chief method of fixation, with large fenestra for drainage with steel



FIG. 12.—Incomplete fracture of lower end of femur by shell fragment. Shows symmetrical arrangement of bone along walls of wound of exit.

arches incorporated in the cast to provide support over these points. It has been very satisfactory when good plaster has been obtainable and when a proper extension table is available, but lacking these and in inexperienced hands, other methods are advisable. We have been using a modified Balkan splint which is a suspension frame with extension applicable in all directions. It is adaptable for both arms and legs, the arms being suspended either without support or in abduction in a modified Thomas splint. The legs and thighs are slung by means of some anterior or posterior moulded splint and extension applied directly to the leg. The patient may move about in bed a certain amount, and dressings are very easily done as the limb is always accessible. For fractures with simple dressings the ordinary forms of apparatus are applicable with occasional slight modifications.

For the after-treatment of these septic fractures, we have used hypochlorous acid solution 1:200, and more recently hypertonic saline solution has been tried in a number of cases. Both methods have given very satisfactory results, and thus far we are unable to say which is preferable. Both solutions are used either as a constant irrigation in foul wounds with much necrotic tissue present or as hot dressings changed every two to three hours with intermittent irrigations; after the wound has been cleaned up, some simple form of dressing is used. In the wounds with large open areas secondary suture is done as soon as possible, not with the idea of closing over a septic bone focus, but to diminish to a minimum scar formation and disabling contractures.

Bone plates have been used in fourteen instances of compound fractures and with what



FIG. 13.—Fracture of tibia by bullet at foot, comminuted by absence of comminution, slight displacement and the tendency to formation of long sinuses.



we consider good results in some cases. In the light of this experience with them we believe that there are a certain few septic open fractures in which the use of the bone plate is justifiable. They were applied only in those cases in which malposition was still present after all external methods of fixation had been tried. The plates were put in with the knowledge that they would have to be removed later and we believe the results were better in spite of the prolongation of the sepsis and the increased necrosis at site of the screws than could have been obtained by allowing union to take place in malposition with a corrective operation after sepsis had cleared up. The plates undoubtedly do retard or inhibit callus formation at their site, consequently they should be removed as soon as there is enough callus present to fix the bone ends in position, and should never be left till firm union occurs or till the plates are loosened or extruded. As one is working with bone of very low vitality, it is more necessary than ever to operate with a minimum of trauma. One of the cases proved most instructive, showing clearly the absence of regeneration around the bone plate. It was a case with a fracture of the lower end of the femur and an amputated leg. The femur had been plated, and later, after union had taken place, it was found necessary to do an amputation of the thigh because of contraction of the hamstring muscles interfering with the wearing of an artificial leg. The specimen obtained showed a firm symmetrical callus with firm union except at the site of the plate, and for 1 cm. on all sides there was a total absence of all callus, with devitalized bone present only at this point. There was non-union in one case of compound fracture of the lower end of the femur, to be mentioned in detail later.

Twenty amputations were done in the entire series, of which eight were performed in the field hospitals before entrance. They were: one of the arm for fractured humerus with severed brachial artery, one of the thigh for comminuted fracture of the lower end of the femur and septic knee, another of the thigh for fracture of both bones with a septic knee joint, three of the leg for infected shell or bomb wounds, with much loss of bone, one of the forearm for fractured both bones and severed arteries, and two fingers for mutilating wounds. There have been twelve done here,—eight fingers, two of the thigh, one for non-union with osteomyelitis, the other already mentioned for contracted muscles in a stump, one of the leg for fracture of the tarsal and metatarsal bones with toxic absorption, and one of the forearm for a fracture of both bones, with gas bacillus infection. All the six major amputations done in field hospitals were done by the circular no-flap method of Fitzmaurice Kelly, and in five of them reamputation was necessary because of osteomyelitis in the bone ends and retracted flaps. The simple fractures were all of the types usually seen, and their treatment

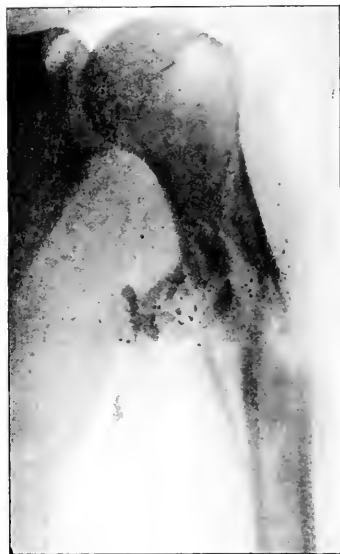


FIG. 14.—Fracture of humerus by a bullet with comparatively low velocity which has lodged in chest wall. The fracture is of the "butterfly" type with a slight rotation of the lower fragment.

did not differ from that ordinarily used. Three of them were bone-plated, the wounds remaining clean and the plates remaining in position.

*Complications.* The patients, with very few exceptions, were strong, healthy young men, and the ordinary medical complications were very rare; there was no pneumonia in the entire series, and syphilis was not suspected in a single case. Many of them presented multiple wounds of the soft parts of more or less severity, which, while seldom serious, complicated the application of apparatus.

Two cases of tetanus appeared, both in men with compound fracture of the leg. The first had an incubation period of two weeks in a man who had not had a prophylactic dose of serum, ran a mild course, was treated by intravenous and intrathecal injections of serum and recovered. The second was a case of the so-called latent tetanus appearing two months after injury. Seven weeks after being wounded he was given ether and the position of leg corrected; one week later tetanus of a mild character developed, reacted quickly to anti-tetanic serum given subcutaneously and made an uneventful recovery. (Reported by Dr. D. P. Penhallow in the *Lancet*, Feb. 26, 1916.) There has been one case developing erysipelas in the series.

*Necrosis.* As has been said, the treatment in many cases resolved itself into that of a fracture complicated by a localized necrosis, and it



is this complication that has proved one of the most difficult to deal with. There were two varieties of necrosis, the first being the necrosis resulting from the trauma of the injury giving rise to devitalized fragments, which when not removed at the preliminary operation later extruded themselves or had to be removed. This is the comparatively small price one pays for the conservative treatment of comminuted fragments already mentioned. The other variety of necrosis was due to infection acting on what at the time of the original operation was viable bone. Of the 243 cases with infected fractures, operation was found necessary for the removal of sequestra in 115 cases, or in nearly 50% of the cases, and often multiple operations were done for this purpose. They were done for the most part after the callus formation was well established, and a conservative plan was still followed, endeavoring to wait until the necrosed fragments had spontaneously separated from the sound bone, then removing them, with care not to traumatize any of the surrounding bone; the indiscriminate and vigorous curetting of these areas, often causing the formation of distressing cavities, very hard to close in, and infection of healthy bone. Often primary union was obtained after excision of the sinus, removal of the sequestra and sterilization of the cavity. In eight cases in which there was a fracture through the head of the humerus, excision was necessary in 6 cases, 2 with little comminution were reduced and union took place. The plan adopted in regard to the treatment of

the head was the same as that mentioned above, any loose pieces were removed immediately, and excision, complete or partial, done after it was seen that there had been established a line of demarcation between the dead and living bone. Of 4 wounds of the head and neck of the femur, excision was necessary in one case.

*Non-union and Delayed Union.* There were two cases of delayed union, one a simple fracture of the shaft of the humerus in good position in a healthy man. At the end of three months there was a very slight callus with no stiffening; blood was injected into the callus, and firm union was present 6 weeks later. Another was a transverse fracture of the proximal phalanx, caused by a knife; no union was present after eight weeks, so friction was made between the fragments, and union soon took place.

Seven cases with non-union occurred, one a case already mentioned in a middle-aged man with a transverse fracture in the lower third of the femur, with a foul discharging wound. He had been treated two months in a field hospital before entrance, and was very anemic, debilitated and somewhat toxic. Fresh drainage was provided, and for four months extension maintained the bone in good position, without any union resulting. A bone plate was then applied, and at the expiration of ten weeks, no union having resulted, an amputation was done, and absolutely no evidence of repair was found, due probably to the extensive osteomyelitis and necrosis in the bone ends. There were three cases somewhat similar in type, two of the radius and one of the ulna, in which there were long gaps between the fragments, varying from four to six inches in length. They were all the type of fracture caused by bullets at short ranges, with very large wounds of exit, so that the finely comminuted fragments were lying in the open septic wound, and in one case all bone fragments were removed by the surgeon. This type of wound, with the accompanying bone conditions, is shown in Figs. 5, 6, 9, 10, 11. These cases were discharged with this disabling deformity, but it is conceivable that a bone graft might be tried in such conditions, as has been done in the following cases. One, of the humerus, with a septic butterfly fracture of the lower end of the bone, in which all fragments were removed, leaving the typical pointed ends to the upper and lower fragments, with a gap intervening. (See Fig. 18.) It healed eventually, and after three months an inlay graft from the tibia was inserted, with a rapid regeneration of the graft and firm union. (See Fig. 19.) A similar procedure was done to a tibia with a gap of 1½ inches, and union resulted. The other case of non union was a simple transverse fracture of the humerus that had been plated in very poor position before arrival here. No union existed and the plate was loose. The plate was removed, an inlay graft inserted and convalescence was uneventful. Before do-



Fig. 15.—Groove fracture of the lower end of femur by a shell fragment.





FIG. 16.—Perforated bullet wound of wrist with marked disorganization of joint.

ing any clean corrective operation on bone, we have waited till three months after the sepsis has disappeared, and although this may be excessive we have had infection occur, from what was undoubtedly latent sepsis, in operating before this length of time had elapsed.

*Secondary Hemorrhage.* This has occurred only three times in the series while cases were in the hospital,—two from perforating branches of the femoral artery and one from the palmar arch. From the records of other hospitals we were able to obtain information about three cases in which hemorrhage occurred before entrance, one from the brachial and two from the posterior tibial arteries. In one of the latter cases amputation was done. All others were controlled by packing and ligature.

*Nerve Lesions.* In only eight cases was there recorded any serious nerve injury. One of these, an injury to the brachial plexus with paralysis of the arm, followed a comminuted fracture of the outer end of the clavicle. A large bone fragment was found pressing on the plexus and removed, after which function gradually returned, and in two months' time was nearly normal. There were three musculo-spiral paralyses, all occurring with fractures in the lower third of the humerus. In two of these there was found complete division of the nerve, and suture was done in both cases, and in one case the nerve was found caught in the scar and freed. In two instances the external popliteal

nerve was caught in scar with attendant paralysis. Neurolysis was done in both cases. Two radial paralyses were present, one from a severed nerve which was sutured; the other recovered spontaneously during two months following the injury. The median nerve was divided at the wrist and was sutured. We are unable at this time to give a report on the results in these cases as they all left supervision before any definite conclusion could be reached.

*Fracture in Joints.* These were frequent, and were usually attended by disabling and disappointing results. There were 13 fractures into the shoulder joint, 3 closed, the latter recovering with good results. Ten were compound and infected. In 6 of these complete or partial excision of the head of the humerus was necessary, resulting in 2 flail joints and 4 ankylosed joints, and in the 4 remaining cases it was not necessary to remove the head, and a good result was obtained in one case with but slight limitation in abduction, while in the others there was pronounced limitation of motion in all directions. The elbow was involved in 10 fractures, 3 closed, of usual types, and with good function resulting. Seven were compound and septic, resulting in 5 complete ankyloses, and 2 with motion through about half the normal area. The wrist was involved 5 times, all infected, resulting in 3 complete ankyloses and one partial ankylosis and the other having only very slight limitation of motion. The hip joint was opened by septic fractures in 3 cases, 2 of which re-



FIG. 17.—Fracture through head of humerus with removal of portion of head. Shoulder ankylosed in this position resulting in a useful arm.



sulted in complete ankylosis, the other resulting in very slight limitation of motion but with persistent synovitis. There were 4 septic fractures involving the knee joint, resulting in one useful knee and 2 partial and 1 complete ankyloses. There were a number of simple fractures into the ankle of the customary types and 5 compound fractures, 4 of which resulted in nearly complete ankylosis and 1 with only slight limitation of motion.

*Contractions and Ankyloses.* As has been shown, the fractures into joints were followed by a large percentage of disabling ankyloses, but aside from the ankylosis following this type of injury there were those due to other causes. The two principal additional causes were sepsis in the periarticular tissues or in muscle groups and tendons with cicatricial contraction and immobilization of these structures, causing a consequent immobilization of the adjacent joint; second, prolonged immobilization in apparatus. In certain cases with perfect joint surfaces there would be an absolute fixation of the part in a flexed position, due to contracting scar tissue. These were usually cases that had been under treatment for long periods in field hospitals under unfavorable conditions, and their correction offered some most interesting and perplexing problems. The true ankylosis resulting from infected fractures into the joint presents an almost hopeless problem in a military hospital, where time is limited and patients pass out of supervision after leaving the hospital. An attempt has been made in this group of cases to ankylose the joint in the position most favorable for function. For the shoulders we have found the most useful shoulder, for a man who must do manual work, to result from an ankylosis at about 45° from the body, this giving the greatest range of scapular motion, the arm inclining slightly forward from the perpendicular. The flail joints, while of course not resulting from excisions of the classical type, but being done as circumstances permit, give poor functional results; the motions were of fair range but strength was lacking. They were more useful, however, than an ankylosis of the shoulder with the arm near the body, as unfortunately occurred in one case. The elbows were ankylosed at slightly less than a right angle, and the wrists in dorsiflexion. That group of disabilities resulting from contractions may be nearly obviated by the use of correct apparatus from the start. There is a noticeable tendency among inexperienced men doing military surgery to treat each case as two problems, the first of healing the wound without regard to function, and second to secure function if possible. The amount of contraction from the large wounds is deceptive, and always greater than anticipated. Very early massage, and when possible, early passive motion, is instituted on all fractures in an endeavor to minimize the number of ankyloses and contractions from prolonged immobilization.

*Results.* Although we have not been able to follow the cases after they leave the hospital, as this is manifestly impossible while the war is still in progress, yet we have been able to ascertain a certain number of facts concerning the end results. No one man or group of men is responsible for the results, the personnel of the staff having experienced frequent changes, and no one fixed policy of treatment has been pursued since the origin of the hospital; the results should then be a fair general average and comparable to any general military hospital, in which changes of the staff are frequent.

In general the following disposal of a case may be made. He may be sent to duty, in which case he must be able to resume active duty at the expiration of a short furlough, or he may be sent to a convalescent home, in which case he must be able to resume duty in a certain number of weeks and to require no more surgical procedures,—only simple dressings are done here,—and finally he may be invalided out of service if he is not fit for duty, in which case all wounds must be healed and no more surgical care required. A man may be invalided for a certain number of months and then return to the army, but this very rarely occurs. A man is never invalided until every effort has been made to secure the best possible function, as the pension given in general varies with the functional capacity of the individual. In speaking of results, we will have to base the computations on the total number of cases discharged and not the total number of fractures.

*Disposal.* There have been four deaths in the series, but these occurred in those specialized groups of fractures that we have only mentioned and not discussed. They were 3 fractures of the skull and 1 of the spine. There were no fatalities occurring in cases with fractures of the long bones. Of the remaining 306 cases, 137, or 44.2%, have returned directly to duty, 75, or 24.2%, have been sent to convalescent homes, to return to duty in a short space of time, and 94, or 30.1%, have been invalided from the service. Grouping the above, we find 68.4% returned eventually to the army and 30.1% were invalided from service. These figures would be somewhat lower if we excluded the fractures of the skull; as according to recent rulings any man with a trephine opening in the skull is invalided, no matter what his functional capacity may be. The conditions present for which the men with fractures in the extremities were invalided were roughly grouped in Table 2.

TABLE II

Nerve Paralysis .....	5
Ankylosis Shoulder (complete) .....	1
Ankylosis Shoulder (partial) .....	3
Flail Shoulder Joint .....	2
Ankylosis Elbow (complete) .....	5
Ankylosis Elbow (partial) .....	2
Ankylosis Wrist .....	4
Ankylosis Fingers .....	2
Ankylosis of Hip (complete) .....	3





FIG. 18.—Non union of fracture in lower end of humerus. Fracture from a bullet at short range, all bone fragments having been removed on account of sepsis.

Ankylosis of Knee (complete) .....	2
Ankylosis of Knee (partial) .....	5
Ankylosis of Ankle .....	4
Ankylosis of Foot .....	5
Shortening of Femur ( $\frac{1}{2}$ to $2\frac{1}{2}$ inches) ..	9
Non Union (loss of substance) .....	3
Amputations .....	11
Limited Motions from Scar .....	5
Miscellaneous (debility, etc.) .....	8

It is instructive to note that the majority of the cases were invalidated because of lesions affecting the joints, showing the necessity for careful orthopedic supervision, and is a small indication of the opportunities for orthopedic work in a hospital of this kind.

**Function.** In estimating the function at the time of discharge, we have taken the following approximate standard: Good function, to indicate that the individual will be able to resume duties in the army or in civil life, without any diminution in his efficiency. Thus some of the invalidated men may be considered as having good function, although they might not at the time of leaving be unable to do a long march, and as a consequence would be invalidated.

Fair function, to mean a result that will enable a man to resume his usual manner of livelihood, with a somewhat decreased efficiency, but one who will not become an economic burden to the state.

By poor function we mean that the man is incapacitated for active work in civil life, and without some complicated apparatus, for example, an artificial leg, will have a reduced effi-



FIG. 19.—Same case as FIG. 18 three months after application of an inlay graft from tibia held in place with bone pegs.

ciency and will get a pension from the state for life.

Judging by the following standards, we find that there are 219 men with good functions, 46 with fair function, and 41 with poor function. This result is not markedly different from that given before when considering the disposal of the cases, but it shows what proportion will get pensions for life, and translates the results from military terms to those of civil life.

**Time in Hospital.** In order to get some idea how much longer these cases needed to be under supervision than cases in civil life, the length of time elapsing from the time of injury and the time of discharge from surgical supervision has been computed for each fracture, and a general average taken for each group. The averages thus obtained of course do not represent the time required for union, but show the length of time that each group of fractures required surgical supervision, and thus represents in a way the tax put upon the medical service of an army by injuries of this variety. These averages are given in Table 3.

This table also gives the number of cases in each group who were sent to duty; this includes those sent to convalescent camp who return very soon to duty, as explained, those invalidated, and the deaths. The average time elapsing in each group from time of injury till discharged from surgical supervision is given, expressed in days. On cases with two or more fractures the case is placed under the group of the more im-



portant fracture, and the lesser fracture is not included. The totals are expressed in terms of individuals, and not of fractures, as was the case in Table I.

TABLE III.

	Duty	Invalid	Died	Time (Days)
Skull .....	7	12	3	68
Spine .....	1		1	30
Maxillae .....	10			79
Clavicle .....	2			96
Scapula, etc. ....	5	2		
Ribs .....	10	1		87
Humerus .....	23	16		79
Radius .....	9	11		80
Ulna .....	15	3		71
Radius and Ulna ...	3	1		75
Metacarpals .....	35	1		47
Carpals .....	1	2		60
Phalanges (fingers) ..	33	2		51
Femur .....	6	22		142
Patella .....	2	1		60
Tibia .....	15	5		102
Fibula .....	14			80
Tibia and Fibula ..	10	11		116
Tarsals .....	3	2		75
Metatarsals .....	6	2		70
Phalanges (toes) ...	2			63
	212	94	4	

I wish to express my thanks to the Executive Committee of the American Women's War Hospital and to the Chief Surgeon, Dr. D. P. Penhallow, for permission to use the records of the hospital, and to the other members of the Staff for their courtesy in allowing me to follow the progress of certain of these cases in their wards.

## SPECULATIONS REGARDING THE PANCREAS AND METABOLISM IN DIABETES.

By HUGH P. GREELEY, M.D., WACKESHA, WIS.

To the great mass of literature about diabetes it is almost presumptuous to add anything unless it be supported by all sorts of experimental and clinical evidence. The following ideas, however, though unsupported at this time by such evidence, are in the nature of a preliminary statement, and so I venture to present them if only for discussion and refutation.

It is certainly not over-stepping bounds to adopt the premise that diabetes mellitus is a disease of the pancreas. It is also true to say that in degree and severity it is most variable. The ordinary classification of von Noorden into mild, moderately severe and severe types is recognized as arbitrary since there are all gradations and they merge into each other.

We are all born with different heritages. Each organ in the body is destined to have a certain maximum functional "horse power."

By care in breeding and environmental conditions, functional capacities might be increased. Careless breeding and wrong environmental conditions, no doubt, diminish them.

The work of the pancreas, or of its internal secretion is almost as continuous as the heart beat, and only ceases entirely with death when all metabolic activity ceases. Almost all organs of the body are provided with great reserve power. One-half a lung if intact is enough to support life; one kidney is ample; the heart has five or six times as much reserve as it is called upon to exert under anything but the most severe and sudden strain. Experimentally, likewise, one-eighth of a pancreas or less is usually sufficient to prevent the onset of diabetes.

Undoubtedly we are all born with different pancreatic functional capacities varying in the same way that our mental capacities vary, and subject to change through heredity, overwork or disease. Some have less, some more reserve power; some people may have larger and better equipped islets or more of them, others smaller, poorer or fewer. Our pancreases are "geared" to a certain maximum metabolic activity and endurance.

It is wholly reasonable to suppose that in man as well as in experimental animals the functional capacity of the pancreas must be reduced between seven-eighths or nine-tenths before true diabetes ensues. The reduction of functional activity can be relative or absolute, functional or organic, and as varied in its causal relationships as failure of cardiac compensation. In other words the relation of functional capacity to total metabolism is a mathematical one. Supposing the normal figures are represented by  $\frac{4}{5}$ ths pancreatic capacity, covering a metabolic activity of 60 kilos body weight: If the body weight is increased by 40 kilos, the total metabolism requirement would be increased and the functional capacity relatively reduced 66%. The amount of reserve power would determine its sufficiency. Failure of compensation would mean diabetes.

In obesity a very similar condition is present. Obesity may be a condition of abnormal metabolic function resulting in the abnormal storage of energy rather than in its normal combustion, and is closely related to diabetes. An enormous increase in body weight so increases the total metabolism, that the pancreas succumbs to the strain and diabetes ensues. Obesity is only one condition where total metabolism is increased and pancreatic function is disturbed. Fever and Graves' disease are often associated with glycosuria, and if diabetes is preëxistent, it is greatly aggravated, possibly by the greatly reduced relative functional capacity of the pancreases. Hence the fatality of infections in diabetes?

In an opposite way influences which reduce or retard metabolic activity benefit diabetes. It has been known for a long time that morphine



derivatives will drive out the last traces of sugar when only traces remain. May not this be due to a reduction of metabolic activity and a temporary establishment of pancreatic compensation?

The severity of diabetes follows a steadily declining curve as age increases. It is so mild in old age that for years the name diabetes has been denied these cases and glycosuria substituted. The curve of basal metabolism coincides exactly with the curve of severity of diabetes, being greatest in infancy and childhood and least in old age. The severity of a mild case of diabetes is at once increased by the incidence of any accident increasing basal metabolism (fever, infections, goitre). Glycosuria in old people is suddenly true diabetes in the presence of an infection.

The remarkable variations in sugar tolerance in the same diabetic individual has been suggested to argue the functional character of the disease. It does not necessarily follow, however. Severe organic disease in any organ is capable of the same variation of function under the sole influence of rest. Again we think of cardiac compensation. Surely the amount of almost perfect rest afforded by the Allen fasting treatment is ample means of restoring a considerable degree of tolerance, and it is noticeable that the more rapidly the carbohydrate tolerance has been broken down, generally, the more rapid its recovery; the slower, the more difficult. In one case we may be dealing with fatigue; in the other, exhaustion of an already weakened organ. Of course there are other factors which increase tolerance as well as rest,—factors which promote better combustion of energy, mental preoccupation and muscular activity. However, the remarkable success of the Allen fasting, I believe, is largely due to this element of relatively absolute rest. Rest is the *raison d'être* for almost all medical treatment of chronic metabolic disease. That variations in the diabetic condition point to the functional nature of the disease in large majorities of the cases is insupportable, since the most prolonged periods of rest and freedom from all signs of the disease have not resulted to date in many cases of authentic, complete and permanent restoration of pancreatic function; only a relative compensation of function which prevailed only so long as the amount of work was regulated to the power of the pancreas for that work.

The proof of theories must be left to the experimental worker. Theories are merely the results of deductive reasoning. However, some of the clinical facts which seem to support these views are these:

*Diabetes in obesity.* Cases are so frequent that individual case histories do not require citation. In every man's experience there have occurred typical cases like the following: A man of 275 pounds develops diabetes with acute symptoms: polyuria, polydipsia, loss of weight, perhaps acidosis. His case seems acute and

severe. After four to six months without treatment he may lose 100 pounds, and his diabetes seems to suffer an automatic remission. All the acute symptoms have disappeared. Nature has attempted a crude cure. By reducing bulk and total metabolism, an overstrained, weakened and insufficient pancreas has become relatively vastly more sufficient to its job. However, infection, which would immediately accelerate metabolism, would instantly cause exacerbation of all acute symptoms and render the case severe again.

It is equally interesting to observe the opposite in children. Among our cases are many children, who on first examination seemed mild cases without acidosis, and with relatively high carbohydrate tolerance. A typical example is case No. 876, a boy of six, who in 1912 weighed 45 pounds and had a sugar tolerance of 30 grams. He has been kept wholly sugar free, with rare accidents, and yet today, at the age of 9, he weighs 60 pounds and his tolerance is about 20 grams. His growth and metabolic requirements have increased over 30%, and his sugar tolerance has decreased a like percentage. This story might be reproduced many times in our series and seems to show that diabetes is a progressive disease in children, but closer analysis shows that it is really the child who is progressive, and not the pathological condition. The most painstaking pathological examinations have failed to reveal definite organic lesions. This probably argues an inborn insufficiency of the Islands of Langerhans functional or organic (numerical?). Pathological examination would not be complete unless size and number of islands were taken into account.

Von Noorden and others have drawn attention to the fact that familial diabetes tends to occur at earlier ages in consecutive generations. If the age of onset in the first instance was sixty-five, the inherited functional capacity would be relatively lower at an earlier age in the next generation because of the greater metabolic demands at this earlier age, and would thereby explain the observed phenomenon.

Provided these theories are sound, it would be possible to predict to a mathematical certainty the future course of carbohydrate tolerance in children with diabetes. Given the age, weight and carbohydrate tolerance, the expected normal rate of growth and increase of metabolic activity would proportionately decrease the carbohydrate tolerance till it became zero. Modern treatment offers hope for children never before conceived. Intercurrent infections are the pitfall.

It remains to be proven whether continuous successful management results in actual regeneration of power in the pancreas. The thyroid and liver are regenerative organs. The pancreas up to the present time has seemed not to belong to this group.



## Clinical Department.

### A REPORT OF THREE CASES OF TYPHUS FEVER.

By M. G. BERLIN, M.D., DORCHESTER, MASS.

THE cases here reported occurred at the Boston City Hospital (Third Medical Service) during the writer's period of internship.

The fact that typhus fever is a rare disease in the United States seemed sufficient reason for reporting these cases.

**CASE 1.** H. K., a single man, aged 23, born in Russia; arrived in this country ten days previous to onset of present illness. His family history was not remarkable. He had typhoid fever ten years ago and was sick then for four weeks. His habits were good and he denied venereal disease.

He was admitted to the Third Medical Service, Boston City Hospital, May 14, 1914. The onset of his present illness was very acute, with severe headache, chills and fever. There was no cough or expectoration, no dyspnea or palpitation. The appetite was very poor. There was no vomiting or diarrhea. No pain in the abdomen or chest. Micturition was normal; urine concentrated and diminished in amount. He said that he had had several small nosebleeds in the past ten days. He was well developed and well nourished. Conscious and rational, but slightly stuporous; his temperature was 104° F. The pupils were equal, regular, and reacted promptly to light and distance. The teeth showed marked sordes, and there was slight pyorrhea. The tongue protruded in the median line, was tremulous and showed a moderately thick dry white coat. The throat was moderately congested. The neck was not rigid. There was no glandular enlargement. Heart: the area of dullness extended from 3 cm. to the right of the median line to 9.5 cm. to the left apex in fifth intercostal space, just inside the left nipple. Action rapid, regular, and sounds of good quality; P>A, no murmurs. Lungs were resonant and breathing normal. Abdomen was level, soft and tympanitic; no tenderness, masses or spasm elicited; the liver and spleen not made out. The knee jerks were present and active on both sides. The skin showed a subcuticular eruption, petechial in character, with occasional dried-up vesicles. The individual spots were from 1-3 mm. in diameter. This eruption was over the abdomen, chest and back; it was not present on the face or the extremities.

Urine examination negative.

White blood count, 6500.

Blood culture taken.

*Progress of Case.*—May 16. Rash is more intense and is now present on the arms and legs. Temperature and pulse remain high. Spots in most instances do not disappear with pressure; petechial in character. Widal reaction negative.

May 18.—Temperature remains high. Rash unchanged. There is marked stupor. Pulse rapid and weak. Slight cyanosis and dyspnea appeared. Slight cough appeared, and there were numerous moist râles in both bases. Cardiac stimulation was instituted.

May 20. Condition unchanged. Prostration is

marked and patient is in intense delirium. Widals persistently negative. Blood culture negative.

May 22. This afternoon, on the 17th day of the disease, the temperature dropped to normal, by crisis; the pulse and respiration also dropped. General condition is somewhat improved. Rash is fading. The patient shows marked emaciation. Subsequent to the last note the general condition improved so rapidly that the patient was able to sit up by June 10, and was discharged well on June 18, 1914.

I happened to meet the patient about three months ago, and he appeared to be enjoying good health, having gained ninety pounds since he left the hospital.

**CASE 2.** Sarah B., aged 34, admitted August 2, 1914; said to have been only ten days in this country. Her father and one brother died of cholera morbus. Her mother and three brothers are living and well. Her husband and three children are living and well. No miscarriages. No chronic diseases in the family. She is said to have had measles, varicella, scarlatina, and mumps when a child. Had typhoid fever at ten years; sick then for seven weeks. Catamenia began at 16 and has been normal since. Her habits were good.

Present illness began abruptly eight days ago, two days after her arrival in this country, with general malaise, followed, on the second day, by chills, fever, severe headache and vomiting. Some nosebleed. No cough or expectoration, no night sweats. No urinary or intestinal disturbances.

Physical examination showed a fairly well developed and well-nourished woman, markedly prostrated. The face was flushed. Pupils normal. Teeth poor. Tongue coated and tremulous. Throat was markedly inflamed; no exudate or membrane seen. Heart was normal. Lungs showed many medium moist râles, but there was no impaired resonance. The abdomen showed tenderness over the epigastrium and over the spleen. The liver was felt 2 cm. below the right costal border. The spleen was palpable. The skin over the abdomen, chest, arms and legs showed a fine subcuticular mottling, largely petechial.

*Progress of Case.* The temperature remained elevated for four days after admission, when it dropped to normal by crisis. The vomiting persisted for three days. Patient was only mildly delirious at times. Widals and blood cultures negative. Condition improved rapidly, so that patient was allowed to sit up on the 12th, and discharged well on the 15th day of August, 1914.

**CASE 3.** A. D., married man, 29 years of age. Clerk in a pawn shop. Admitted on July 25, 1915. Family history irrelevant. Past history: measles, mumps and scarlatina when a child. Pneumonia when at Rutland State Sanatorium four years ago. Had many attacks of hemoptysis seven years ago. In Rutland off and on since 1910. Discharged "improved" on May 1, 1915. His habits were good and he denied venereal disease.

Present illness began rather abruptly six days ago with chills, fever, and severe headache. He began to vomit three days ago and still continues to do so. Has also had generalized abdominal pain, colicky in character. Appetite poor and bowels costive. Sleeps poorly. No nosebleeds. No cough or expectoration. No night sweats. No pain in the chest.





CASE 1.

Physical examination revealed a well-developed and well-nourished man, conscious and rational, very restless and uncomfortable because of some abdominal pain. Lungs showed impaired resonance throughout, especially at both tops, front and back. Breathing was broncho-vesicular throughout—especially marked at both tops. No râles heard. No friction rubs made out. Abdomen was distended, soft and tympanitic; there were no masses, tenderness or spasm. Liver and spleen not made out. Extremities negative. Skin showed a fine macular eruption over chest and abdomen, resembling rose spots, but much more abundant, and did not disappear on pressure.

July 26. Patient markedly prostrated, temperature high, pulse rapid, vomits his food.

Urine, fever urine.

Wassermann on blood negative.

Blood culture negative for typhoid bacilli.

Sputum showed no tubercle bacilli.

Widal reaction negative.

July 27. Temperature rose to 104°F. this afternoon. Patient somewhat delirious. Rash persists. Widal again negative.

July 29. Temperature still elevated but patient looks a little brighter, says he feels somewhat better. Rash appears to begin to fade. Widal negative.

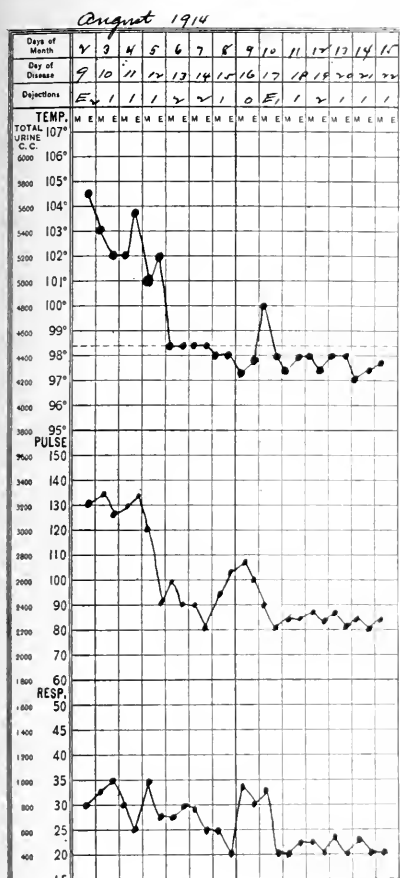
July 30. Temperature dropped to normal by crisis, early this morning, and patient looks much better. Rash fading decidedly.

Condition improved rapidly. Patient was allowed to sit up on the first of August and discharged well on August 4, 1915.

#### POINTS OF INTEREST.

1. The diagnosis in these cases was made on the suddenness of the onset, negative blood cultures and persistently negative Widals, the early





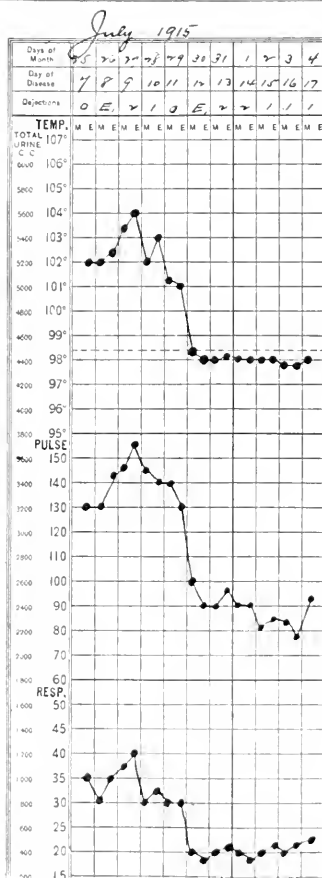
CASE 2.

mental symptoms and the early marked prostration; the distinctive subcutaneous eruption and the termination by crisis. The diagnosis in all these was confirmed by Dr. Edwin H. Place, and, in the last case, also by Drs. Mahoney and Shea of the City Board of Health.

2. A very interesting point was brought out by Drs. Mahoney and Shea in the last case: the patient, who was a clerk in a pawn shop, was handling old clothes brought in by sailors, hence the great possibility of the source of infection.

3. The first two cases apparently contracted the disease on board ship, as they were both only a few days in this country when they took sick.

4. Patients were kept in the general wards and no cross infections occurred. The attendants, as well as the doctors and nurses, all



CASE 3.

escaped infection. This fact goes to show how much good hygiene and sanitation will do towards controlling a highly contagious disease like typhus fever—as has been so well demonstrated in the recent typhus epidemic in Serbia.

5. It is worthy of note that there were two male patients against one female, and that the latter had a comparatively mild attack,—facts well recognized in most cases reported.

6. It is remarkable that for years previous to this series there has been no case of typhus fever admitted to the Boston City Hospital, while these three cases appeared within the short period of fourteen months.

I desire herewith to express to the Visiting Physician of the Third Medical Service, Dr. John L. Ames, my grateful appreciation of the opportunity to record these cases.



## Medical Progress.

### REPORT ON DERMATOLOGY.

By JOHN T. BOWEN, M.D., BOSTON.

- I. The Modern Treatment of Burns.
- II. X-ray Treatment of Scalp Ringworm.
- III. Trichloroacetic Acid in Dermatology.
- IV. New and Old Methods of Treatment.
- V. Scleroderma with Disease of the Thyroid.

#### THE MODERN TREATMENT OF BURNS.

DR. TARNOWSKY<sup>1</sup> bases his article on the experience obtained by treating several hundred electric burns, together with some experimental work, at the Cook County Hospital in Chicago. Theoretically every burn might be considered as a sterilized wound, but practically it must be treated as an infected one on account of the contamination that must have occurred before it is seen by the physician. The problem is, therefore, to remove infective material and avoid the destruction of cells that are still living. Hence there should be no vigorous scrubbing with brush and strong soap, no application of powerful antiseptics, such as bichloride or cyanide of mercury, picric acid and phenol solution, etc. In a burn of the first degree, the papillary layer of the corium is intact, and the tactile bulbs being scarcely affected, the pain is not severe. The deeper epidermal layers will rapidly replace the damaged cells above them, if the former cells are not destroyed by strong antiseptics or by scrubbing.

The writer's technic for a burn of the first degree is described. As a prophylactic measure, all those employed by the Northwestern Elevated Railway Company are told not to apply to a burn anything but vaseline, and then to cover the burnt area with gauze before sending the patient to the hospital. The area beyond the burn is first cleaned of all grease and dirt by a fresh sponge soaked in ether, and gently applied also to the burnt surface, which is covered with an ointment of equal parts of cold cream and zinc oxide ointment, to which 5% white precipitate of mercury has been added. A sterile gauze compress and bandage is placed over this, and unless there is severe pain or a rise in temperature, this dressing is not removed until peeling has taken place. Bullae should be opened only if they cause pain by their tension. A gauze mask, with holes for eyes, nose and mouth, is to be used as a dressing for the face. In the hospital the open-air treatment is to be preferred, screen cages being used for burns of the extremities. Stearate of zinc or bismuth powder is all the dressing that need be applied.

In burns of the second degree the pain may be intense and the whole surface of the epidermis destroyed, leaving the bleeding papillae and terminal nerve bulbs exposed. The question

arises whether the wound shall be left to heal by connective tissue formation alone, thus producing a scar, or whether grafts must be used to replace the burnt epithelial cells; and this question must be answered by the location of the burn and by cosmetic considerations. All second-grade burns of face, neck and hands, or feet, or when situated in the vicinity of joints, must be grafted. The relief of the pain caused by the exposure of the nerve-endings is obtained by some protective covering, such as amniotic grafts, plain vaseline, or the ammoniated mercury ointment described above.

The summary of the writer's experience is as follows:

1. Leave burns of the first degree to nature as far as possible.
2. In burns of the second degree, decide early whether to resort to skin grafting; if deemed necessary, apply the grafts as soon as shock has abated, even in the presence of pus.
3. The open-air treatment of burns of all degrees gives the best results.
4. If the open-air treatment is impossible to follow out, apply a bland non-adherent dressing, and leave it on as long as possible.
5. In all second and third degree burns, pain must be overcome by protecting the exposed tactile bulbs. Amniotic membrane, or a bland, non-irritating ointment will give the best results.

#### X-RAY TREATMENT OF SCALP RINGWORM.

Mackie and Remer<sup>2</sup> of Columbia University, who have previously published a technic for measuring the quality and quantity of the x-ray, with a discussion regarding the value of the pastilles of platino-cyanide of barium, publish in the *Medical Record* the results of their experience in treating scalp ringworm with the x-rays. This affection varies curiously according to the geographical distribution, the Mississippi Valley, for instance, being almost exempt from it, while in New York it is quite common and extremely obstinate. The older methods, as epilation and strong antiparasitides, they consider ineffective in the case of the poorer classes, chiefly because it is found to be impracticable to carry out the treatment. Hence the disease remains more or less active until puberty, when it disappears spontaneously. The disease being contagious, the children are kept from school, and their education consequently neglected.

The value of the x-ray in this affection depends chiefly on its capacity for making the hair fall out. It does not essentially destroy the parasitic growth, although it may perhaps modify the soil so that the growth is inhibited. The greater part of the parasitic growth comes away with the hair, and the rest disappears or is destroyed by anti-parasitic treatment. The x-rays are applied either in the divided dose, as generally practised in America, or in the mas-



sive dose as advocated and employed in Europe to a great extent. The writers consider the divided-dose method unscientific and antiquated, in the treatment of ringworm of the scalp, as there is no accurate measurement, and the whole scalp cannot be epilated without considerable danger. It was in 1904 that Sabouraud and Noiré called attention to the application of the intensive method of treatment in scalp ringworm, and since then the disease has been treated in this way in almost all of the European clinics with such good effect that it has been almost eradicated from some of the cities.

The method adopted by the writers is not claimed as original, but has been the result of the work of many investigators. The essential points in the technic, which aims at complete depilation at a single sitting, are thus enumerated:

1. Cut the hair short. Indicate with a skin pencil five points—A, B, C, D and E—on the scalp, which are exactly five inches apart, and draw lines between the various points.

2. Apply an epilating dose (II I at skin distance, B 9 or 10) to each of the five points. Apply protection only to the face, ears, and neck. The vertical rays are aimed directly at the point under treatment and each exposure must be at right angles to the other exposures.

3. Measure the quantity accurately with a reliable radiometer. The quality must be estimated by means of some reliable penetrometer, such as the Benoist instrument, together with indirect methods such as the milliamperemeter, ammeter, etc.

4. The head must not move very much during the exposure. Absolute immobility is desirable.

This intensive method of treating ringworm of the scalp is accurate and scientific, but on account of the delicate technic it can be employed only by trained radiotherapists. The hair falls out at the end of about three weeks, and begins to grow in again in about three months. No irritating substances must be applied to the scalp for two to three weeks previous to this epilation or for a month after, when a 5% ointment of sulphur or ammoniated mercury or other mild parasiticide may be used. A linen cap is to be worn by the child while the hair is falling, to prevent the infection of other children. Some irritation may appear on the scalp a week or two after this treatment, or there may be a transitory erythema. A bad result and permanent alopecia indicates an error in technic. Occasional relapses occur, making it necessary to depilate a second time, and in such cases a period of about six months should be allowed to elapse. No cases of idiosyncrasy have been observed. The x-ray treatment of scalp ringworm cannot, however, be said to be wholly without danger; but the writers declare that if properly conducted, it is the best means we have

at present of quickly curing the affection; and the same is to be said of favus.

(That this method of procedure is not necessary or superior to others in the treatment of the well-to-do classes is granted by the writers, at the start; and the element of danger that they concede at the close, while slight, should be taken into careful account. It is admitted by almost all observers that ringworm of the scalp varies greatly in its frequency, and also in its response to treatment in different localities. In New England, as illustrated by the patients who apply for treatment in Boston, this malady, among the better classes, does not belong in the category of the more obstinate skin affections. Careful attention to the hygiene of the whole scalp and head is most important during local treatment of areas of ringworm,—a point that has not been sufficiently emphasized. Daily soap washings and mild borated and antiseptic lotions should be ordered for the whole head. Epilation and the application of parasiticides to the affected areas, in addition to this, will bring about a cure in from three to four months in almost all cases when the treatment is rigorously followed, and care taken to prevent reinfection from any source. This is a period no longer than that claimed for the treatment by intensive x-ray exposure, and the method is wholly devoid of danger. The intensive x-ray treatment of ringworm in the vicinity of Boston should be limited to hospital practice among people who are unable or unwilling to carry out other methods systematically, and should always be confined to the hands of experienced radiologists. Reporter.)

#### TRICHLOROACETIC ACID IN DERMATOLOGY.<sup>3</sup>

A paper was read, at the 39th annual meeting of the American Dermatological Society, on the uses of trichloroacetic acid in dermatology, by Dr. Charles N. Davis of Philadelphia. Dr. Davis was led to the use of this acid by the fact, pointed out to him by a laryngologist, that it caused a dry eschar when used as a cauterant on the mucous membrane of the mouth. Hence he concluded that a dry eschar on the skin would be of advantage in preventing the invasion of micro-organisms. He first used it with good results on patches of degenerative seborrhea and on pigmented moles. His method of procedure is to cleanse first the surface of the skin with benzine, to remove the oil, then to clean further with an alcohol pad. Then a saturated solution of the acid is applied to the area to be operated on with a piece of cotton twisted on a Japanese bamboo toothpick until the surface is white. Then a pad of cotton wet with water is applied to cause the acid to act more thoroughly on the tissues. Then the acid is neutralized with an alkaline solution, usually a 4 or 5% Labarraque solution. The cauterized area is then covered with an ichthyol varnish, 25% of ichthyol in a saturated solution of bor-



acetic acid, to which eight grains of tragacanth to the ounce is added. A small bit of teased-out cotton is then inserted, which in turn is painted with the ichthyol varnish. Usually there is no secondary infection, and the original dressing may be left on until the wound heals over.

This method of treatment has been found most efficient in pigmentations, papillomata, and naevi. In soft and flat warts, and in verruca senilis, the treatment with the acid is best preceded by the application of salicylic acid plaster to the area, this salicylic acid plaster to be covered in with a larger piece of ichthyol plaster, worn if possible for five or six days. Davis thinks that this is the ideal form of treatment in xanthoma palpebrarum. One painting is usually sufficient. The eyelid is put on the stretch to widen the patch, and to make sure that the edge is cauterized. It is afterward to be carefully dressed with the ichthyol varnish, without embedding the bit of cotton. The scar that follows is slightly depressed, but the eyelid folds back normally. Its action is excellent, also, in the so-called spider cancer, forming a thrombus. In the small, elevated, compressible naevi in children, Davis prefers the acid to carbon dioxide snow, as it is easy of application, causes little pain, and is not followed by inflammatory lesions. It is also very satisfactory in molluscum contagiosum. Usually one painting causes them to dry up and fall off in a few days. The small fibromata of the chest and neck are also treated in this way. He has had good results also in lupus erythematosus and in acne varioliformis. In beginning rodent ulcer and in small superficial epithelioma of the face, especially in the timid who refuse a radical excision, or in cases in which it seems wise not to reveal the nature of the trouble, Davis recommends removing the crusts, wearing a salicylic-diachylon ointment for a few days and then dusting powdered cocaine on the raw surface. This causes anesthesia to eurenting, after which cocaine is again dusted on, and the base cauterized for a sixteenth to an eighth of an inch outside of the border, and the wound then covered with ichthyol varnish. This he finds much more satisfactory than the old method of caustic potash and pyrogallol. Oftentimes these will heal without having to remove the original fixed ichthyol varnish dressing. Benign cystic epitheliomata have also been treated in this way. It has been found valuable also in fissures about the mucous orifices and in milium.

#### NEW AND OLD METHODS OF TREATMENT.

MacKee<sup>1</sup> read a very logical and sane paper to the Section of Pediatrics of the New York Academy of Medicine on January 13, 1916, on the subject of the modern treatment of skin diseases. He refers to the recent tendency to search for the causes of cutaneous disturbances in the internal secretions, gastro-intestinal troubles, fecal infection, etc., as marking a hopeful

outlook, although very little has as yet been added in the shape of practical results. He considers that research has added much to our knowledge of eczema. Sabouraud and Whitfield have shown that the so-called eczema between the toes and fingers, and also eczema marginatum of the groin and thighs, is of parasitic origin. Other researchers have thrown some light on the catarrhs of the skin following a local pyogenic infection, and on many occupational disorders.

In specific lines of therapeutics of the skin progress has not been very remarkable during the last year or two. MacKee speaks cautiously of vaccine therapeutics. He seems hopeful of the future of vaccine treatment of ringworm of the scalp, a method now under trial, but of which it is too early to predict results. The former successes reported from the vaccine treatment of acne vulgaris have not been substantiated. Polyvalent stock mixtures of the staphylococcus, if properly used, are of distinct value in pustular acne, but will not produce a cure unless combined with other methods. He thinks tuberculin treatment is specific for erythema induratum. The Kromayer lamp, which produces actinic and ultra violet rays, has been found at Fordyce's clinic in New York to be efficacious in many cases of acne vulgaris and alopecia areata, as well as in certain types of psoriasis, eczema, and lichen planus. In more serious and obstinate cases, such as lupus and naevi, when the ultra violet rays alone are indicated, MacKee has had no success with it.

With regard to radium, MacKee thinks that there is a decided misunderstanding as to the comparative value of this agent and of the x-rays. Radium has given excellent results in the treatment of deep-seated vascular naevi, but is not so effective in port-wine mark. It is superior to x-ray in leucoplakia and lupus erythematosus, and in inaccessible locations. The x-ray is indicated where extensive surfaces are to be treated.

With regard to auto-serum, his conclusions are that although it may have some results in the treatment of psoriasis, urticaria, and certain vesicular and bullous affections, its results do not, on the whole, warrant the time, trouble, and expense.

Refrigeration, by carbon dioxide snow, is considered to have stood the test of time, and to be one of our most valuable agents in the treatment of lupus erythematosus and of some naevi. It should never be used in the treatment of epithelioma.

MacKee rightly calls attention to the fact that we often lose sight of the value of the older methods of treatment. Trimble has recently reported cases of lupus erythematosus successfully treated by some of the older methods, such as quinine and the tincture of iodine. Davis has shown the superiority of trichloroacetic acid in certain affections, and the fact that keloid follows the use of this substance less frequently



than that of any other chemical caustic; and Sherwell has cured epitheliomata with acid nitrate of mercury where both x-ray and surgery have failed.

The best hope of progress lies in the combined efforts of the dermatologist and the internist, aided by the physiological chemist, the bacteriologist and the pathologist.

#### SCLERODERMA WITH DISEASE OF THE THYROID.<sup>3</sup>

Sequeira, of London, describes four cases of scleroderma associated with thyroid disease. In three of these cases Graves' disease was present, in one the scleroderma developed in a myxoedematous patient who was taking thyroid. These four cases were part of a series of twenty-two seen by the writer during recent years. The first case concerned a single woman of 22, who presented a sclerodermatous condition of the lower half of the left leg, the duration of which is not stated. Over this area an ulcer had developed secondarily, from an injury. There was also a small area of scleroderma on the inner side of the right leg. The thyroid gland was enlarged and prominent and there was marked tachycardia. The ulcer was gradually healed by means of stimulating applications. Two courses of thyroid extract, as has been recommended, had no effect on the scleroderma, or on the ulcer, and it seemed as if the general condition was made worse. X-ray applied to the enlarged thyroid had a definite effect on the general condition and may have contributed to the healing of the ulcer, but had no appreciable effect on the scleroderma.

The second case was also a woman of 22, who presented several areas of scleroderma in the chest and over the scapulae as well as on the hips. The patient was anemic, suffered from frequent headaches, had a quick pulse, protrusion of the eyeballs and an enlargement of the thyroid gland. The third case developed in a woman of 59, who showed patches of scleroderma on each leg, with tachycardia, proptosis, and protrusion of the thyroid gland. The fourth case was that of a woman of 42, who had had a scleroderma of both lower legs for about a year. She had been under treatment for myxoedema with thyroid extract for fifteen years. She showed a remarkable sensitiveness to the drug, which had kept the myxoedema under control.

Discussing the pathogenesis of this affection, Sequeira observes that it occurs in connection with such a variety of conditions that it is hard to believe that many of the causal relationships that have been claimed for it have a sure foundation. Theories of a lymphatic, infectious, and tropho-neurotic origin have been advanced in turn, the last named being the one that has been most popular. It has also been claimed to be the result of extensive endarteritis, and has occasionally been associated with Raynaud's disease. Its possible relationship, in some cases at least, with syphilis has been advanced, and posi-

tive Wassermann reactions have been recorded by a number of observers. The coexistence of scleroderma and affections of the thyroid has been noted by many writers. According to Roques, thyroid atrophy seems to be more common than hypertrophy. Yet Dittisheim found eight cases of scleroderma in seventeen cases of exophthalmic goitre. Treatment by means of the thyroid gland has not proved very satisfactory. Roques collected 67 cases in which this treatment had been employed, with the result of a cure in four, an improvement in 32, and no effect in 31. Sequeira agrees with Osler that thyroid extract has no specific action in scleroderma as it has in myxoedema. He could not find that the skin in any case became softened or regained its normal consistency. Addison's disease has sometimes been reported as coexisting with scleroderma, but Osler's caution that hyperpigmentation is very common in scleroderma should be emphasized.

The writer's own conclusions are that lymphatic obstruction as a cause may be excluded. The localized band variety may probably be considered with propriety a tropho-neurosis. While it is true that a certain proportion of the cases are associated with affections of the thyroid gland, there is nothing to warrant the assertion that alterations in the activity of the gland or of its secretions are actually the cause of the affection. The fact that both atrophy and hypertrophy of the thyroid accompany this condition makes one cautious in forming conclusions.

It is impossible to exclude changes in the character of the secretion.

#### REFERENCES.

- <sup>1</sup> *Journal of Cutaneous Diseases*, March, 1916.
- <sup>2</sup> *The Medical Record*, August 7, 1915.
- <sup>3</sup> *The Journal of Cutaneous Diseases*, October, 1915.
- <sup>4</sup> *New York Medical Journal*, March 4, 1916.
- <sup>5</sup> *British Journal of Dermatology*, January, March, 1916.

### Society Report.

#### THE NEW ENGLAND SOCIETY OF DERMATOLOGY AND SYPHILIS.

The third meeting of the Society was held at the Massachusetts General Hospital on January 27, 1916, with the president, Dr. Abner Post, in the chair.

The following cases were presented:

##### I. BRUCCINOMYCOSIS.

Presented by Dr. C. J. WHITE.

Twenty-six years ago, a man, now sixty-four years of age, was sick in bed with fever, rash and sore throat for about five weeks. During this illness he first noticed a small "pimple" upon the dorsum of the left hand appearing in the scar of an extensive burn, which he had received two years previously. This lesion gradually enlarged and formed a shallow



ulcer. At the outset a similar lesion appeared just beneath the right lower eyelid which has enlarged and remained in a more or less active condition ever since. There was also a painful lesion on the left instep which healed, leaving a deep scar. The lesion on the left arm showed but little tendency to increase in size until two years ago, but since that time there has been a progressive enlargement of the original ulcer and several new ones have appeared both upon the arm and upon the fingers of the left hand. The patient states that the ulcers have always tended to heal centrally and extend peripherally. For many years the patient has taken large doses of KI., even up to gr. 480 a week.

Today, the man presents at the outer canthus of his right eye, involving both lids, a roughly symmetrical lesion, the size of a twenty-five cent piece, with sharp borders and red granulating base. On the left forearm, just above the wrist, is an irregular ulcer about the size of the palm of the hand, with dirty granulations and irregular bluish edges. Above this area are two dime-sized lesions with heaped-up, pearly crusts. Covering almost the entire left forearm is the scar of the burn received twenty-eight years ago. There is a small, irregular scar upon the left instep the size of a dime.

With applications of fuchsin ointment the ulcer upon the arm showed every indication of rapid healing. Ten days after admission fuchsin ointment being no longer available, balsam of Peru was substituted. Tissue was removed for diagnosis and under the microscope presented a typical picture of blastomycosis. Several smears of pus secured from the lesions since that time have contained numerous budding organisms.

## 2. NAEVUS VASCULARIS TREATED BY THE KROMAYER LAMP.

Presented by DR. E. L. OLIVER.

The patient was a young woman with a "port wine" mark covering a large portion of her right cheek. Various men had tried divers means of destruction, including CO<sub>2</sub> snow and radium. The artificial snow had proved ineffectual, while radium had diminished the color somewhat, but was proving a very slow method owing to the small available supply of the metal. Several exposures to the Kromayer lamp have produced results decidedly superior to those gained by previous methods, both in the bleaching of the color and in the size of the areas treated.

## 3. DERMATITIS HERPETIFORMIS.

Presented by DR. C. J. WHITE.

In January, 1915, an eruption of small vesicles appeared upon the right arm of a woman, age thirty-eight. At this time the patient was in poor general condition and consulted her local physician, who prescribed for anemia a medicine containing KI. gr. 15 t.i.d. Within a few hours after the ingestion of the first dose of this medicine, the lymph nodes of both sides of the neck became swollen and painful. This glandular reaction was followed at once by a diffuse vesicular eruption distributed over the region about the lower jaw, neck, and upper chest. During a period of two weeks following, the process spread in segmental crops of vesicles down the trunk and extremities, each crop lasting two or three days. The patient remained in bed during this period. Itching was persistent.

Treatment consisted of the application of a sulphur ointment together with the medicine mentioned above. In June a second eruption similar to the first appeared upon the trunk, but was mild in nature and persisted only a few days. From that time until the present attack, small groups of vesicles have been present somewhere on the body. About Thanksgiving time many new lesions appeared and the patient resumed the use of the medicine prescribed in January. Following this, a rapidly spreading generalized vesicular eruption broke out, and from that time until entrance to the hospital, Dec. 27, 1915, many new crops of vesicles have continued to appear.

The skin generally, with the exception of the face and abdomen, is covered with a papular eruption and shows many punctate and linear excoriations. The papules are discrete and confluent, many with umbilicated tops covered with thin sero-hemorrhagic crusts. Many of the lesions are arranged in a more or less crescentic manner. There are many shiny, erythematous areas resulting from former lesions. Moderate enlargement of the lymph nodes of both groins is present. The Wassermann test is negative.

During the patient's stay in the ward, many small groups of vesicles have appeared from time to time. The treatment has consisted of a non-acid diet, Fowler's solution and the local applications of a sulphur-zinc oxide-lard ointment.

## 4. DECEPTIVE TINEA TRICOPHYTINA (MICROSPORON AUDOUIN).

Presented by DR. F. S. BURNS.

Duration one year (?). Over the mid-occipital region, a little to the left of the median line, there is a rounded area, two inches in diameter, consisting of a good deal of dry, coarse, furfuraceous scaling, without apparent alopecia, and without any cutaneous alteration. Hairs removed from this area reveal profusion of small spores.

## 5. INHERITED SYPHILIS.

Presented by DR. C. MORTON SMITH.

The mother of the patient has a strongly positive Wassermann reaction, but no clinical signs of lues. Her infection occurred probably seven or eight years ago, as she had a stillbirth with macerated fetus at that time.

The patient was born at full term, apparently healthy, and is now six weeks old. Marked snuffles developed soon after birth and have persisted. A general syphilide appeared within a few days, maculo-papular in type, with vesicles and small bullae in the palms and soles. The child is poorly developed and nourished, and has thin hair over the temples and prominent veins. There are transverse fissures of the lips and cracks at the corners of the mouth. There is a general glandular enlargement, a purulent conjunctivitis and profuse nasal discharge, making breathing difficult at times. There are also mucous lesions about the anus.

## 6. LARGE-SPORED RINGWORM.

Presented by DR. C. J. WHITE.

The present eruption began one month ago, when there was noticed a discrete, circular lesion about the size of a twenty-five cent piece, showing a tendency toward scaling, which in a few days changed to a thick yellow crust. The patient applied iodine, but



the lesion steadily became larger in circumference and markedly raised above the level of skin surface. Ten days ago the man was seen by a local physician, who advised the daily cleansing of the lesion with H<sub>2</sub>O, and the application of a paste. There is no history of similar condition among his associates and no ringworm has been observed upon his cattle.

Physical examination is negative except for the local condition of the skin beneath the jaw, where there is a lesion three by five cm. raised about 1/2 cm. above the level of the skin, reddened, infiltrated and showing loss of most of the hairs of the beard and numerous infected follicles from which pus can be expressed. There is no reaction in the surrounding skin. Beneath the left jaw are two smaller lesions of a similar character. Under the microscope pus expressed from largest lesion shows many spores compatible with the megalosporon ectothrix ringworm.

#### 7. TUBERCULOSIS CUTIS WITH TUBERCULOSIS OF THE LARYNX.

Presented by Dr. J. H. BLAISDELL.

A man, perhaps twenty-eight years of age, decidedly aphonic from tuberculosis of the larynx, asserts that the present condition of the skin has existed for two years. Today, over the metacarpophalangeal joint of the left forefinger is a circular area, the distal half of which is surrounded by a markedly elevated purple wall, which is not papular but uneven, merely an exaggeration of the central structure. The skin is infiltrated, dry, and cracking. The microscopical examination reveals the tuberculous structure of the lesion.

There is also practically complete obliteration of the opening from the naso-pharynx to the throat, apparently due to late destructive ulcerations and the formation of extensive scar tissue. The Wassermann test is strongly positive.

#### 8. LICHEN PLANUS OR SYPHILIS(?).

Presented by Dr. J. H. BLAISDELL.

Six years ago a man, now forty-two years of age, had a lesion on his penis, which was followed in three months by sore throats, headaches and falling hair. Subsequent to anti-syphilitic treatment by a local physician the lesions disappeared and the patient has been without symptoms until last March, when the present eruption started on the legs, today, the arms, thighs, and lower legs are involved. The eruption is papular, dull red to violaceous and the locations on the legs there is distinct hyperkeratosis and scaling. No angular, flat-topped papules, however, can be noted in any instance. On the inner aspect of the lower left arm there is a three-centimeter annular lesion made up of fairly shiny papules with some superficial atrophy. On the shaft of the penis and on the scrotum there are three, irregular, one-sized lesions, with bluish, raised periphery. The Wassermann test is negative.

#### 9. CONGENITAL SYPHILIS.

Presented by Dr. C. MORTON SMITH.

A young man, nineteen years old, presents extensive scar tissue in the nose and throat. There is a opening between the mouth and nose which allows a certain amount of air through the nose by inhalation, but the patient cannot force any air outward through his nose. A probe cannot find a passage from the mouth to the naso-pharynx.

There is a perfectly smooth mucous membrane extending from the hard palate down as far as one can see. Dr. A. Coolidge states that there is a combination of two processes present. One of the common processes is for the gummatous infiltration in the soft palate to break down and make a large opening from the mouth to the nose. That gives an exaggerated palate. Then there is another condition where the gummatous process starts in the posterior pharyngeal wall.

#### 10. LUPUS PERIO.

Presented by Dr. F. S. BURNS.

Miss K. H. was born in Ireland thirty years ago, and after coming to America developed the present skin affection. The patient's feet become cold in winter, but as yet do not present any lesions. Two years ago the right ear became involved and one year ago the hands. The lobule of the right ear and adjacent skin, for a distance of a half inch in all directions, is involved. The lesion consists of an atrophic cicatrix covered with fine, parchment-like scales and at the lower portion, at the junction with the cheek, the edge is slightly infiltrated, still more scaly and suggests lupus erythematosus. The backs of both hands and fingers, especially the latter, are involved. Both hands show a moderate degree of passive congestion, consistent with a mild pernio. In addition to the pernio there are distributed over the backs of all the fingers, except the ring fingers of both hands, areas of livid red congestion, elevated in most cases, either actively congestive and with vesicular edges or in varying stages of subsidence of the exudative element.

#### 11. CONGENITAL SYPHILIS.

Presented by Dr. ARNER POST.

A case of considerable interest. There is a symmetrical synovitis of the knees. Symmetrical synovitis is fairly common in connection with hereditary disease of this sort. There is rather an exception in the character of the present patient because most of these cases present simply synovitis while the knees are not flexed. Here, however, the knees are flexed and appear to be enlarged. There is considerable heat and an inclination toward a peculiar shape, one joint being a little smaller than the other. There is a slight amount of fluid in the ankle, though very slight.

#### 12. PSORIASIS OF THE PALMS.

Presented by Dr. J. H. BLAISDELL.

A woman, aged forty-five, has six children living and three children dead. The present condition of the hands began one year ago with great itching, and has continued despite treatment. Today the whole palm is covered with a rather moist coating of tiny yellow scales. The lesions extend around onto the back of the hands, where there is, beyond the scaling, a quarter-inch band of dull red infiltration, sharply delineated. On several knuckles there are curious islands of the same dull red infiltration with some puckering and some macerous scaling. There is one small silvery-scaling papule on the elbow. The Wassermann test is negative.

#### 13. ERYTHEMA INDEURATUM SCROFULOSORUM.

Presented by Dr. F. S. BURNS.

On December 15, 1915, Miss R. G., aged twenty-five, was admitted to the Skin Ward of the Massa-



achusetts General Hospital. For eighteen months she had noted deep lumps in the back of the right lower leg. A doctor had prescribed KI. without any improvement and had incised previous similar lesions. At entrance there were three red, hard, tender nodules deep in the skin, besides the scars of the older lesions. The active lesions were thoroughly curetted under ether and the patient was discharged on January 1, 1916. Examination on January 27 revealed the process completely healed and soundly cicatrized.

#### 14. DERMATITIS HERPETIFORMIS.

Presented by DR. C. J. WHITE.

Patient, aged nine, was admitted to the Skin Ward of the Massachusetts General Hospital, November 13, 1915. Nothing remarkable was discovered in his family or past history. The patient gives a very indefinite history of skin trouble at intervals for two years, but during the past summer the skin is said to have been free from eruption of any sort. Beginning in October, the present eruption appeared, and is generalized over the entire body, even in the scalp and on the soles of the feet. It consists of diffusely distributed, erythematous-vesicular rings, varying in size, discrete and confluent, and forming extensive gyrate configurations. Sparsely distributed are crusted areas, probably the site of vesicles, some of which have become infected.

At several different periods since admission the skin has cleared up generally, with the exception of a few vesicular lesions, which appear from day to day. These quiescent periods have been followed by new eruptions diffusely spread over the skin surfaces.

Nov. 13, W.C., 13,400; Polys., 68%; Lymph., 28%; Eosin., 4%; Hb., 70%.

Jan. 20, W.C., 7600; Polys., 43.5%; Lymph., 42%; Eosin., 4%; Hb., 75%; Trans., 10%.

#### 15. HIDRADENITIS DESTRUCTENS SUPPURATIVA.

Presented by DR. C. MORTON SMITH.

Mrs. X., aged twenty-three years, first noticed trouble with her skin when she was eleven or twelve years old. The eruption comes only during the winter months, and has recurred every winter, save one, since the beginning. Many scars of previous lesions are to be found on the feet and lower legs, and a few on the hands. At present there are fifteen to twenty-five active lesions, limited to the feet and legs, and these consist of pinhead-sized, acuminate, pus-topped papules, which leave behind them practically always a smooth, depressed, pit-like scar, resembling closely the scar of acne necrotica.

The general condition of the patient is slightly, if at all, impaired, but her feet are always cold and moist. There is little pain, but much soreness in the lesions, and those going on to pus-formation throb and ache.

Biopsy by Dr. C. J. White four or five years ago showed the condition to be hidradenitis destructens suppurativa,—a process, pathologically tuberculous, involving the sweat glands.

#### 16. DERMATITIS EXFOLIATIVA.

Presented by DR. C. J. WHITE.

In July, 1914, the patient, a woman of sixty, noticed an extensive scabiorrheal (?) condition of the

scalp. In September the skin of the palms of both hands became thickened and exhibited a tendency to fissure and itch. Within a few days the skin over the anterior portions of the chest began to scale, and gradually the process became a universal one. At times the skin showed a tendency to clear up, but relapses always followed. She was treated by a local physician, who prescribed ointment applications with little result. Since onset the condition has never wholly cleared up.

On admittance to the hospital, Feb. 17, 1915, the scalp showed rather well-marked alopecia, and was covered with dirty, greasy-white scales. Upon the face were symmetrical areas of clear skin, that is, above the inner half of each eye and upon the bridge of the nose. Elsewhere the skin was reddened and scaling. The hands showed thick scaling with fissuring of the skin, especially the left. Upon the arms, shoulders, middle of the back and lower legs, the skin was generally erythematous and scaling profusely, particularly upon the legs, which were covered with large scaling plaques. The soles of the feet presented heavy crusting and marked fissuring.

During her entire stay in the hospital exfoliation of the skin continued, with but slight tendency to clear up. At discharge, the patient's general condition was much better than at entrance.

Since leaving hospital in May the patient has applied various remedies to her skin with little change in her condition. She entered the hospital again in August, 1915, and at that time the skin over the entire body, including the scalp, presented a marked erythema, with thickening, dryness and profuse desquamation. The scales varied from small papery scales to large thick plaques. The process was particularly evident over both lower legs, and the folds of the skin in the popliteal spaces showed much fissuring. There was slight ectropion of both lower lids and the conjunctivae were injected.

On re-entrance, treatment with starch baths, i.i.d. and zinc oxide starch powder was begun and followed by some tendency toward improvement in the skin condition. On Oct. 1 all previous treatment was omitted, and the so-called dry treatment, with borated talcum powder and nothing else, was instituted. Under this régime the patient showed steady improvement, until the entire body, save the scalp, was free from scales. To hasten the cleansing of this region, an ointment was applied, contrary to my best judgment, and very shortly the whole disease, in its most aggravated moist form, was back upon us, and for a few days in November the patient's condition became so serious that she was placed upon the "dangerous list." With resumption of the dry treatment, the patient slowly, but only partly, regained her former condition. On April 14, 1916, the skin of most of the body is red and somewhat scaly, but in June the patient reported herself wholly recovered.

On entrance, W.C., 7800; Hb., 60%; Polys., 66%; Monos., 26%; Eosin., 8%; Trans., 6%.

January 27, W.C., 10,800; Hb., 65%; Polys., 52%; Monos., 34%; Eosin., 12%; Trans., 2%.

#### 17. EPITHELIOMA(?)

Presented by DR. BOARDMAN.

The patient is a man sixty-seven years of age, who began to have trouble with his leg forty-seven years ago. An ulceration developed on the front of



the leg, gradually worked around, but finally healed under various forms of treatment, and remained well until two years ago, when it broke down again. At present there is an area on the back of the leg which at no time has shown any ulceration, but has been covered with cheesy, necrotic material, which, if left alone, grows about an inch thick. If this material is removed one finds a fungating appearance underneath. The patient has refused to have a biopsy made.

Dr. Boardman believes that the disease is an epithelioma which developed from a nevus, which ulcerated and then changed over into an epithelioma. Amputation has been advised but refused.

#### 18. THE NEW TREATMENT OF PSORIASIS BY A NON-CARBOHYDRATE DIET.

Presented by Dr. L. J. CUMMINS.

The patients were placed in the ward and at first given starvation diet with whiskey and water every two hours for the first two days. It was astonishing how the patients stood this starvation. Later we began the treatment without the starvation diet. We began with carbohydrates, twenty grams for three days, then increased to thirty, kept on that three or four days, and then worked up to forty. When the psoriasis did not respond as quickly, we restricted the amount to twenty grams.

The patient presented has been in the ward for four weeks. At entrance she was almost completely covered with heavily scaling lesions. The scaling was quickly diminished and the remaining large erythematous plaques are breaking up very rapidly, while no infiltration has lessened. All the patients who have been under our care in the ward have done very well. We have had over eighty cases in the out-patient Department who have all been given a diabetic diet, and those who have followed the diet have responded very well. When starch and carbohydrates are reduced the expense of food diet is actually doubled.

Dr. TOWLE: What has been done in other respects? How about other food substances?

Dr. CUMMINS: Proteids, between fifty to one hundred grams. Fats, between 100 to 200, bringing a calories up to between two to three hundred.

Dr. OLIVER: How much weight have these patients lost?

Dr. CUMMINS: Between four and ten pounds during their stay in the ward. The patients who started on starvation diet cleared up more quickly than those put on the limited diet. There has been no external or internal medication.

#### 1. THE TREATMENT OF ACNE ROSACEA BY RONTGENIZATION.

Presented by Dr. L. J. CUMMINS.

We have had eight cases in our series, which we have been treating by x-ray exposure to the thyroid. Patients were from twenty-five to thirty-five years of age. The first patient had distinct hyperthyroidism and was sent to x-ray for treatment. After the first x-ray exposure rosacea was markedly less. Since then I have been observing cases and sending them to x-ray for treatment. They all had shortness of breath on exertion, fine tremor, rapid pulse, and were highly nervous. The interval between exposures has been from two to three weeks, so that one has had three treatments.

The subjective symptoms of itching and burning

have ceased after the first exposure, and we have seen improvement in all cases so far, but have not followed these exposures long enough to note any cures.

Dr. TOWLE: Do you expose the nose or cheeks?

Dr. CUMMINS: The radiations have been limited to the region of the thyroid gland.

CHARLES J. WHITE, *Secretary*.

### Book Reviews.

#### *Changes in the Food Supply and Their Relation*

*To Nutrition.* By LAFAYETTE B. MENDEL, Professor of Physiological Chemistry in the Sheffield Scientific School. New Haven: Yale University Press. 1916.

This monograph is an essay written for the meeting of the Second Pan-American Scientific Congress in Washington, in December, 1915. The author points out that the three fundamental conditions of modern civilization are food supply, sources of mechanical energy or power, and methods of transportation. The purpose of his essay is to show the effect which modern preservatives and transportation facilities have had on the food supply and on the possibilities of nutrition of civilized mankind. The fact that well-to-do communities have the resources of practically the entire world at their command at all seasons of the year, not only has an extensive economic effect, but upon the dietetic changes that result may depend important biologic evolutionary alterations. Dr. Bryant and others have recently pointed out the variations in physical form which may be determined or at least largely influenced by dietetic conditions. Perhaps the most interesting and timely portion of this work is that referring to food conditions as at present prevailing in the central European empires during the blockade to which they are subjected as a result of the war. The author comments particularly on the scientific acumen of the German nation in its public propaganda to meet the situation thus created. Especial reference is made to the German literature which has already arisen on this subject, to which the principal contributors are Drs. Eltzbacher, Oppenheimer, Rubner and Zuntz. The volume is of distinct value as a contribution to the study of modern dietetics and economics.

*A Purin Free Dietary.* By EDNA ALICE WAITE AND ROBERT ELSWORTH PICK, M.D. Woodmont, Conn. 1916.

This manual consists of a purin free diet list, a series of sample menus and a collection of recipes for making the dishes prescribed in a purin free diet. It should be of interest and value to dietitians and a convenience to physicians dealing with cases requiring such treatment.



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## ELECTRIC DELINEATION OF VISCERA.

In the issue of the *British Medical Journal* for September 30, 1916 (page 459), was published an article describing the work of Dr. James Shearer at a casualty clearing station in France on a new method of electric delineation of the internal organs of the body. This method, which utilizes the electricity of the body, suggests a combination of wireless telegraphy and electric photography, yet, in reality, it has no relation to either of these. Indeed, it succeeds at exactly the point where x-ray photography fails, in that it enables the production of pictures of soft organs and other structures far within the surface of the body. In these pictures general outlines are exceedingly clear, but no details are visible.

What the work seems to do in its present stage is to enable it to be stated, without any manual or other examination, whether the more important viscera of a living patient—such as the

liver, the kidneys, the spleen, and the brain—are intact so far as their gross anatomy is concerned, while at the same time it supplies evidence of any departure from the normal, in the nature of a considerable enlargement or diminution in size, or an effusion of blood, or the presence of a foreign body, or the existence of a tear or rent of the visceral surface.

The inventor states his belief that the results are primarily due to the interposition between two alternating electric fields of equal strength, and at the precise point where these fields meet, a third electric field, whose facultative potential force is thus released, and becomes convertible into dynamic power. This released circuit operates a recording needle, which maps out on a revolving cylinder a pattern varying with the shape of the organ which furnishes the circuit. The appliances employed are two electric batteries of precisely equal strength, whose current alternations can be produced and varied at will. Two electrodes are arranged for application to the patient's body, each connected with a perforated zinc plate or a zinc wire screen. One of these screens stands vertically on a movable pedestal. The other is held in the air by wire supports and is movable in a horizontal position four or five feet above the center of the first screen (screen A). Any electric field emanating from screen A is, therefore, always at right angles to that of screen B, the currents supplying these fields being derived from the two batteries, with their alternating interruptors. From one of the electrodes a wire is led to a revolving drum resembling a barograph, over which is suspended a needle hammer capable of lateral as well as vertical motion. The drum cylinder carries a rolled sheet of paper coated with paraffine, on which the outline of the organ is to be recorded. The needle hammer is connected with a carbon diaphragm like that of a telephone, which, in its turn, is operated by a current detector, capable, not only of picking up and measuring, but also of concentrating currents too small to be convertible into force by any other means. The method of operation of this apparatus is described in the original article as follows:

"The first step is to place the patient in the right position in relation to the two screens. He must be quite close and head on to the vertical screen A, and the organ to be examined must be directly under screen B, though at a considerable distance from it, and at the same time present the desired plane towards screen A.



"The right position having been secured, the following steps are taken: (1) An intact wax sheet is put upon the recording cylinder; (2) the rate at which the cylinder shall revolve is determined; (3) the appliance which regulates the rapidity of the alterations is adjusted; (4) the currents from batteries A and B are simultaneously released, with the immediate result that the recording cylinder begins to revolve while the hammer needle moves across it steadily, giving rise at each stroke to a slight click. This movement of the needle is allowed to continue until it has twice traversed the cylinder from end to end, and the currents are then cut off.

"What has happened in the mean time is that the current from battery A has reached the electrode A, and has thence been projected horizontally from all parts of screen A as an electric field. The same thing has happened in regard to the current from battery B, but the direction of the field projecting from screen B has been vertically downwards.

"What has also happened is that the two fields have met at right angles, and as they are of precisely equal strength, and are synchronized in respect of alternations, it might be expected that they would have precisely neutralized one another, and that consequently no exhibition of dynamic force would be obtainable from them.

"But in practice this is not what occurs. On the contrary, provided that the body under examination is that of a living person (or is one in which merely somatic, not cellular, death has occurred), an effective current from below always manages to reach electrode B, and thence passes to the detector.

"The result, therefore, has been that the hammer needle mentioned has been put into operation and has tapped out on the revolving wax sheet below it a diagram which precisely resembles the outline of the living tissues lying vertically below screen B.

"This diagram can be discerned forthwith by holding the wax film against a strong light, and can be converted into an ordinary photograph by processes of a type quite familiar in various applied arts."

The inventor's view of this process involves the supposition that every organ in the body constitutes and originates a separate electric field, and that the facultative, dynamic power of this field, and also its shape, varies precisely with the constitution and shape of each organ.

"The explanation here given may be insufficient to account for all the results, or even to be in direct conflict with accepted views concerning body electricity. But, after all, very little is at present known concerning organic tissues as a source of electrical force, and in any case the fact remains that it is on this theory that the

inventor and the originator of the process has worked out his discovery and is at present endeavoring to perfect it in respect of mechanical details.

"While the greater part of the process has been developed by constructing a novel theory and converting it into a practice, a good many of the results so far obtained are due to experiment. It has been found, for instance, that the appliances must be tuned for different organs and different tissues.

"In other words, the rate of alternations in the currents, and therefore the force of each electrical impulsive, must be varied according to the rate of vibration of the tissue molecules. Thus the electrical force residing in blood is very small; so, when blood vessels are to be delineated, the alternations must be very rapid. Contrarywise, since the electric force residing in heart muscle is great, the alternations must be slow when a heart is to be delineated."

The practical value of this peculiar and brilliant discovery promises to be considerable. Further report on the employment is announced to appear in an early issue of the *British Medical Journal*. If experience bears out early expectations, this discovery should open a new field of diagnosis, which may prove applicable in many diverse conditions, not only surgical but medical.

It is of interest that the discoverer of this new method, a Scotsman by birth, obtained his medical education in the United States, receiving the degrees of M.D. and Ch.M. at the University of Washington in 1907. At the outbreak of the European War he entered the British Army Medical Corps as a sergeant. His special electrical knowledge, however, and the use which he made of it in the development of his invention, led speedily to the recognition of his ability, and he has recently been commissioned as a captain.

#### PREVENTION AND RELIEF OF HEART DISEASE.

IN the weekly bulletin of the New York Health Department for November 11, 1916, is published a preliminary account of the work of the committee of this department for the prevention and relief of heart disease. A program has been outlined by this committee dealing with the provision of suitable occupation for cardiac patients, the organization of cardiac classes, the increase of opportunity for cardiac patients in convalescent institutions, and the



provision of permanent institutional care for cardiac patients with permanently broken compensation and little or no prospect of future restoration. In addition, it is hoped that a way may be found to keep all public playgrounds open for the entire year. In comment upon this work the bulletin says:

The Committee's program is of special interest now that public attention is focused on the after-care of poliomyelitis. For the latter, as our readers know, funds have been forthcoming from many different sources. As a matter of fact, the problem presented by the proper care of cardiac cases is the more important of the two. It is estimated that there are about 20,000 children alone suffering from heart disease and requiring systematic care. In a number of ways the two groups need similar provision for relief. Thus both groups should be under constant social and medical supervision; the members of both groups should be fitted for occupations suited to their infirmity; some of the children in both groups need to be taken to school in conveyances. Altogether, it would seem likely that a similar plan of procedure would be developed, especially that a way be found to coordinate the work of existing agencies to the fullest extent.

As one of the many phases of disease prevention and control, the work of this New York committee deserves the interested attention of the profession to the possibilities of its accomplishment.

#### PROGRESS OF POLIOMYELITIS.

DURING the past week the epidemic of poliomyelitis in Massachusetts has continued to decline. During the first seventeen days of November, 139 cases were reported, giving a total of 1854 since the beginning of the year.

On November 11 the Massachusetts State Department of Health announced that, in conjunction with the Harvard Infantile Paralysis Commission, it purposes to open a clinic in Boston for the after-care of recovered cases of poliomyelitis. The complete statement issued is as follows:

"As previously announced, the Governor and Council gave the State Department of Health \$5000 from the contingent fund with which to inaugurate a system of after-care of patients suffering from infantile paralysis. This year there have been in the State more than 1700

cases of this disease, a figure much in excess of any previous years. Of the non-fatal cases a considerable majority will suffer a varying amount of permanent defect. With proper treatment the amount of defect may be reduced and, in some cases, wholly avoided.

"Because of the hitherto comparatively infrequent occurrence of this disease, experience in the treatment of the disease has been limited.

"For this reason it seems desirable to offer opportunity for all patients to receive the most skillful treatment possible. To this end the State Department of Health has joined with the Harvard Infantile Paralysis Commission in providing a series of clinics to be located in Boston and at points outside the Metropolitan area where physicians may bring their patients for consultation and advice as to treatment. Patients will be received only with the consent of the attending physician.

"The work of the clinics will be under the supervision of the Harvard Infantile Paralysis Commission, with skilled surgeons in attendance at the clinics, together with nurses especially trained for the work, to assist at the clinics, to care for the follow-up work in the homes and to instruct patients and their parents as to exercise and treatment advised. Where physicians are unable to accompany their patients to the clinic, the suggestions will be communicated to them by letter.

"The members of the commission are Roger Pierce; Dr. F. W. Peabody, who is interested in the care of acute cases; Dr. R. W. Lovett, who is particularly interested in the after-care of infantile paralysis; and Dr. M. J. Rosenau, who is especially interested in the study of the disease and research problems.

"The Boston clinic will probably open on November 23 at the Children's Hospital. The hour and place, as well as the time and location of the clinics outside of Boston, will be announced later."

#### MEDICAL NOTES.

LONDON DEATH RATES IN SEPTEMBER.—Statistics recently published show that the total death rate of London in September, 1916, was only 12 per thousand inhabitants living. Among the several districts and boroughs the highest rate was 16.6 in Poplar, a populous East Side slum, and the lowest was 6.7, in the central region of the city.

AMERICAN ELECTRIC-THERAPEUTIC ASSOCIATION.—At the recent annual meeting of the American Electro-Therapeutic Association the following officers were elected for the ensuing year:



President, Dr. J. Willard Travell, New York.  
 Vice-Presidents, Dr. William Martin, Atlantic City, N. J.; Dr. Frank B. Granger, Boston;  
 Dr. Frank E. Peckham, Providence, R. I.;  
 Dr. William L. Clark, Philadelphia; Dr. A. B. Hirsh, Philadelphia.  
 Treasurer, Dr. Emil Henel, New York.  
 Secretary, Dr. Byron S. Price, New York.  
 Registrar, Dr. Frederick M. Law, New York.

**NATIONAL BOARD OF MEDICAL EXAMINERS.**—The National Board of Medical Examiners held its first examination at Washington, D. C., on October 16-21. There were thirty-two applicants representing twenty-four medical schools from seventeen states. Of these, sixteen candidates were accepted as having the necessary preliminary and medical qualifications. Ten of these took the examination and five passed. The second examination will be held at Washington in June, 1917. Further information may be obtained from the secretary of the board, Dr. J. F. Rodman, 2106 Walnut Street, Philadelphia.

**UNIVERSITY OF CHICAGO MEDICAL SCHOOL.**—Report from New York on November 10 states that the General Education Board, in cooperation with the Rockefeller Foundation, has appropriated the sum of \$2,000,000 for the establishment of a medical school at the University of Chicago. The University itself is to appropriate the same amount and to furnish a site of land valued at \$500,000. An additional sum of \$3,500,000 is to be raised which, with funds already in hand, will furnish an initial endowment of \$8,000,000. On November 14 it was announced that Mr. Julius Rosenwald of Chicago, one of the trustees of the University, had given \$500,000 towards this endowment fund.

#### EUROPEAN WAR NOTES.

**VICTORIA CROSS FOR BRITISH SURGEONS.**—In the issue of the *Lancet* for October 28, announcement is made of the recent award of the Victoria Cross to two British surgeons. The first award is to Dr. William Barnsley Allen, M.C., R.A.M.C., a medical graduate of Sheffield University, "for most conspicuous bravery and devotion to duty. When gun detachments were unloading H. E. ammunition from wagons which had just come up, the enemy suddenly began to shell the battery position. The first shell fell on one of the limbers, exploded the ammunition and caused several casualties. Captain Allen saw the occurrence and at once, with utter disregard of danger, ran straight across the open, under heavy shell-fire, commenced dressing the wounded, and undoubtedly by his promptness saved many of them from bleeding to death. He was himself hit four times during the first hour by pieces of shells, one of which fractured two of his ribs, but he never even mentioned this at the time, and coolly went on

with his work till the last man was dressed and safely removed. He then went over to another battery and tended a wounded officer. It was only when this was done that he returned to his dugout and reported his own injury."

The second award was to Dr. Noel Godfrey Chavasse, M.C., R.A.M.C., a medical graduate of Oxford, "for most conspicuous bravery and devotion to duty. During an attack he tended the wounded in the open all day, under heavy fire, frequently in view of the enemy. During the ensuing night he searched for wounded on the ground in front of the enemy's lines, for four hours. Next day he took one stretcher-bearer to the advanced trenches, and under heavy shell-fire carried an urgent case for 500 yards into safety, being wounded in the side by a shell splinter during the journey. The same night he took up a party of 20 volunteers, rescued three wounded men from a shell-hole 25 yards from the enemy's trench, buried the bodies of two officers, and collected many identity discs, although fired on by bombs and machine-guns. Altogether he saved the lives of some 20 badly wounded men, besides the ordinary cases which passed through his hands. His courage and self-sacrifice were beyond praise."

**A GERMAN UNDERGROUND HOSPITAL.**—A recent issue of the *Medical Press and Circular* quotes from the *London Morning Post* the following account by a British surgeon of a German subterranean hospital at Thiepval, captured during the recent British advance. At first the medical staff of the hospital succeeded in removing all its patients to a place of safety. Later, the surgeon-in-chief and his colleagues were captured and brought back to their former hospital as prisoners.

"The hospital lay two storeys below the ruins of Thiepval—a wide, clean room, lit by candles and small hand-lamps, with every imaginable requisite of a field dressing station at hand. There were drugs unobtainable in England; anti-tetanus and other serums in plenty, oxygen, piles of fresh dressings, surgical instruments neatly arranged beside an operating table—everything except a pair of scissors!"

"Throughout the first night of the British occupation this surgeon worked in the theatre so thoughtfully provided by his enemies. At dawn there was a slight commotion outside. Down a gap leading to the entrance of the hospital dug-out came a German army surgeon, followed by his full staff of twenty orderlies and dressers, pointing to their Red Cross armbands and calling out 'Kamerad!' With the precision of a pre-arranged relief the German staff 'carried on.' A wounded British officer near by was taken in hand by the Württemberger surgeon, who returned to his lamp-lit surgery and began dressing injuries with skilful speed. He was a valuable assistant, and his British colleague pays this tribute to his work."



THE PLIGHT OF POLAND.—Throughout the Kingdom of Poland there is a ratio of 240 deaths to 100 births, declares the late Henryk Sienkiewicz, the distinguished author of "Quo Vadis," in a leading article in the *American Red Cross Magazine* for November, entitled "Behold our Poland!"

"The present war has inflicted injuries on nearly all the peoples of Europe," says Mr. Sienkiewicz, "but on none of them have the calamities pressed so heavily—with a weight as intolerable—as on the Poles, a people of twenty-odd millions, divided between Russia, Austria, and Prussia.

"Belgium and Serbia were devastated by sword and fire, but the storm which passed over these two countries was of short duration, and the Belgian and Serbian soldiers had, at least, the consoling thought that they were giving their lives 'for altars and firesides' in defending their own liberties and their own rights. To the Poles such a consolation was denied. Nearly two millions of Polish soldiers have been drafted in three armies, and in consequence have been forced into a fratricidal struggle.

"Even if Polish territory had not become the theatre of war, this fact alone would constitute a crown of misfortune. But it is precisely on our territory that the struggles have been the most intense, where they have endured the longest, and are again to be renewed. To prevent the rationing of belligerents, the villages and towns have been burned, crops in the granaries and in the fields destroyed, and cattle driven off. They have razed the factories, and those which are standing have been forced to suspend operation in default of raw material and because their machinery has been taken away. As an inevitable consequence of desolation, famine and epidemic prevail throughout Poland.

"In addition to cholera and typhus fever, which, in certain districts, notably in Galicia, are decimating the population, a new malady has made its appearance in our country—the terrible malady of hunger—whose symptoms preceding death are the floating of the body and blindness. Dr. Strauss, of the German Government, has given a precise description of this malady in the *Zeitschrift für ärztliche Fortbildung*. Throughout the Kingdom of Poland the statisticians report a ratio of 240 deaths to 100 births. When the Russians in retreat, pressed by the Germans, took along with them the civil population inhabiting the right bank of the Vistula River, a majority of the children died of hunger, fatigue, and malnutrition. The same happened in the concentration camps of Austria and Prussia.

"For remedying, even in part, this horrible situation, a 'General Aid Committee for the Victims of the War in Poland' was constituted in Vevey, Switzerland, January 9, 1915, under my direction and under that of M. Pader-

ewski. This committee addressed to all civilized people an appeal, signed by myself, asking, in the name of the State of Poland, in view of its merits as a Christian bulwark against the barbaric hordes, as well as its achievements in the domain of science, of art, of progress in general, and of civilization, to succor this people menaced in its very existence.

"Our appeal was not without echo. It was supported by Catholic churches throughout the Christian world. From January 9 to July 1, 1916, we had collected the sum of 12,571,276 francs (\$2,514,253.10), of which amount we had sent, up to the latter date, the sum of 12,137,044 (\$2,427,408) for aiding in Poland the population deprived of shelter and those suffering from hunger without making any distinction between the religions.

"Subsidies in money have been sent to the territories occupied by the Germans and Austrians in Galicia and Lithuania, and to the Poles taken by the Russian Army into Russia; also to those in the concentration camps in Austria. We have obtained in Switzerland authorization to send thirty wagons of condensed milk for the little children. This consignment has been received by the mothers with transports of joy in all the localities of Poland where misery has made itself felt the most. We invariably have sent money, clothing, and provisions destined for Poland to the local committees presided over by Poles of distinction."

Mr. Sienkiewicz declares emphatically that no part of the Polish relief supplies have been requisitioned or confiscated by the belligerents or their armies, and he adds that had one instance of this kind been brought to his attention he would have suspended further consignments of relief stores and dissolved the General Aid Committee for the Victims of the War in Poland.

What the relief agencies have been able to do for the stricken Poles, Mr. Sienkiewicz says, of course, has been woefully inadequate "to alleviate in an efficacious manner the frightful misery which has attacked the millions of our compatriots. Throughout the Polish provinces," he says, "the people, even those with very scanty means for staving off famine, divide what little they have with the poorest of their brethren.

"In America," he continues, "thanks to the devotion and energy of such individuals as M. and Madam Paderewski, Madam Sembrich-Kochanska, Madam Adamowski, and numerous Polish associations, compassion for the tragic fate of our people grows each day more and more, and finds its expression not only in a large material support, but also in the expressions of your most eminent citizens, who raise their voices in defense of our existence and of our right to independence. The noble efforts of President Wilson and Ambassador Gerard definitely to heal the wound of famine in Poland were powerless to vanquish the obstacles which rear themselves in time of war—the selfishness



of the belligerents; but they fill our hearts, nevertheless, with gratitude. We entertain the same sentiments toward your American Red Cross, which several times has forwarded contributions in money and clothing to our committee.

"The fraternal compassion of your country, in which at present takes refuge not only the humane conscience banished from Europe, but also the spirit of Christian charity, fills us with hope and fortifies us in our most bitter hour. The situation of Poland is horrible! However, if the civilized people, jointly and severally answerable to humanity in its entirety, do not cease to regard our cause as they do their own, we will cling fast to the end, and we ourselves will awaken soon, full of force, and ready for a new life in liberty."

**WAR RELIEF FUNDS.**—On November 18 the totals of the principal New England relief funds for the European War reached the following amounts:—

Belgian Fund .....	\$167,447.58
French Wounded Fund .....	142,083.87
Armenian Fund .....	124,251.38
Surgical Dressings Fund .....	57,509.06
Polish Fund .....	47,300.75
LaFayette Fund .....	29,653.53
Russian Refugees' Fund .....	4,917.17

### Massachusetts Medical Society.

#### MIDDLESEX SOUTH DISTRICT MEDICAL SOCIETY.

—At the October meeting of the Middlesex South District Medical Society a special committee was appointed with power to call meetings of members for the purpose of informing them in regard to the proposed social insurance laws. The Committee consists of the following members:

Dr. Charles E. Mongan, Somerville, Chairman; Dr. Frank E. Bateman, Somerville; Dr. Frank W. Plummer, Malden; Dr. Felix McGirr, Cambridge; Dr. Henry A. Wood, Waltham; Dr. P. C. Barthet, Newton Highlands; Dr. Enos H. Biselow, Framingham. Dr. John F. O'Brien, Charlestown.

This committee has already met with local medical societies in the Middlesex South district and is ready to visit, on request, other societies or groups of medical men who are interested in the above-named legislation. Also, on request, it will furnish references to recent literature on the subject. Application for either of these purposes should be made to the chairman.

#### BOSTON AND NEW ENGLAND.

**WEEK'S DEATH RATE IN BOSTON.**—During the week ending Saturday noon, Nov. 18, 1916, the number of deaths reported was 200 against 203 for the same period last year, with a rate of 13.72 against 14.14 last year. There were 32

deaths under one year of age against 40 last year, and 58 deaths over 60 years of age against 63 last year. The number of cases of principal reportable diseases was: Diphtheria, 38; scarlet fever, 18; measles, 14; whooping cough, 10; typhoid fever, 3; tuberculosis, 30. Included in the above were the following cases of non-residents: Diphtheria, 12; tuberculosis, 3; scarlet fever, 5.

Total deaths from these diseases were: Diphtheria, 4; tuberculosis, 18. Included in the above were the following deaths of non-residents: Diphtheria 1; tuberculosis, 3.

**AFTER-CARE OF INFANTILE PARALYSIS.**—Beginning on December 1, 1916, the Orthopedic Department of the Children's Hospital, Boston, will offer a course in muscle training and in the principles of the nursing after-care of infantile paralysis. This course will be open to a limited number of properly qualified women, and will be an all-day course covering a period of about six weeks, most of the work being in the clinics and practical in character.

The money received will be used for the maintenance of the clinic. Pupils who are not likely to prove satisfactory practical workers will be advised to withdraw early in the course and their fee will be returned to them. The course will be under the general supervision, but not under the actual instruction, of Dr. R. W. Lovett, Surgeon to the Hospital, to whom application for admission should be made at the Hospital.

**JOINT PEDIATRIC MEETING.**—Under the auspices of the New England Pediatric Society there was held in Boston, on November 4, a joint meeting of that society with the Pediatric Society of the New York Academy of Medicine, the New York State Pediatric Society and the New Jersey and Philadelphia Pediatric Societies. Visits were made in the forenoon to the principal pediatric clinics of the city. Luncheon was served at the Harvard Medical School and the afternoon was devoted to a trip to the Massachusetts School for the Feeble-minded at Waltham. Dinner was served at the Harvard Club. At the evening session, held in the Boston Medical Library, the principal addresses were made by Dr. G. Hudson McEwen of Philadelphia, Dr. Fenton B. Turk of New York and Dr. W. G. Smilie of Boston.

**MASSACHUSETTS HOMOEOPATHIC HOSPITAL.**—The 46th annual report of the Massachusetts Homoeopathic Hospital, covering the year ended December 31, 1915, has recently been issued. It records a total number of in-patients treated of 7917, making the total number of in-patients treated since the opening of the hospital in 1871 82,928. This was a gain over the previous year of 382 patients. The contagious department treated 1138 patients, a gain of 300 over the



previous year. The new maternity hospital, dedicated on January 1, 1916, supplies accommodation for 76 patients. The operation of this new building has called for added accommodations for increased hospital staff and nurses, and to meet these needs an adjoining building has been purchased. It is also planned to erect a new building to provide for dining-rooms, kitchen and laundry, as well as all machinery, including lighting plant and storerooms. The space now occupied by these departments will be used for much-needed hospital purposes, and will permit the arrangement of a surgical operating pavilion with amphitheatre and smaller operating rooms.

**ANTI-VACCINATION INQUIRY.**—At a recent meeting of the Boston Homeopathic Society the following resolution, relative to the attitude of members of the Massachusetts General Court on anti-vaccination legislation, was adopted:

"Whereas, certain articles of legislation, vitally affecting the public health, will be presented to the incoming Legislature, and,

"Whereas, we physicians, intrusted as we are, with all that pertains to the public health, therefore be it

"Resolved, That the members of this Society, and all other physicians, be requested to ascertain before election the status of each candidate to the Legislature from his senatorial and representative district, on the anti-vaccination bill and the Pang Suey bill, so called, and that each physician be requested to use his influence against any candidate favoring said legislation."

**HOSPITAL BEQUESTS.**—The will of the late Ellen Bailey, who died at West Roxbury, Mass., on October 24, contains bequests of \$2000 to the Children's Hospital, Boston, and \$1000 to the Dorchester Home for Incurables.

The will of the late Louisa F. Crane of Dalton, Mass., which was filed in probate at Pittsfield, Mass., on November 8, contains bequests of \$15,000 to the House of Mercy Hospital, Pittsfield, and \$5000 to the Perkins Institute for the Blind, Boston.

**MORBIDITY STATISTICS OF BOSTON.**—There has recently been completed in Boston by Dr. Lee K. Frankel and Dr. Louis I. Dublin of the Metropolitan Life Insurance Company, through the work of 300 agents, a canvass of nearly 100,000 inhabitants of Boston, with reference to health and morbidity conditions in this city. This survey, which involved house visits on 20,497 families, representing a total of 97,259 individuals, or about 13% of the estimated population of the city, was presented at the recent convention of the American Public Health Association in Cincinnati.

"In all, 1902 cases of sickness were recorded, this being equivalent to a rate of 19.6 persons

sick in 1000 persons canvassed, or under 2%. The report then states that the rate as a whole is distinctly lower than in the surveys made in other cities; the lowest previous rate being 23.1 per 1000, for Rochester, N. Y. The report adds that the very favorable condition shown for Boston may, in part, be the result of the survey being taken in mid-summer, when low mortality and a small number of respiratory disorders usually prevail. The report says nothing, however, of the infantile paralysis epidemic which prevailed in July, as the survey was made in the two weeks beginning July 17 and 24.

Of the 1902 cases of sickness discovered, 1747, or 91.9%, were disabled for work, and 155, or 8.1%, were reported sick but able to work. This indicates a higher percentage of "unable to work" cases than in other surveys, but the report states that the increase is due to the changes in classification whereby some cases returned with ability to work were formerly classified as "unspecified" are now classified as "unable to work."

Concerning the economic loss from sickness in this city the report states: "The estimated male population of Boston, 15 years and over, in 1916 is 272,219. On the basis of the sickness rate determined by this survey for these ages (21.6 per thousand) we may conclude that there are at least 5880 males in Boston constantly sick and disabled. At 300 working days per year per individual, there is a loss of 1,764,000 working days, or 6.5 working days per individual.

This average of time lost for sickness and accident in the general community may be compared with 7.6 days in North Carolina and 7 days in Rochester, N. Y.

"The latest available figures for males of working age in the local sick benefit societies of Germany, namely, for the year 1913 (the year before the war began), shows an average of 8.8 days of disability for work per year.

"In like manner, the 286,081 females of working age may be expected to give a total of 6237 persons constantly sick, which, at 300 working days per year per individual, gives a total loss of 1,871,100 working days, or an average of 6.5 days per individual per year. The corresponding figure for the Rochester survey was 7.7 days; for North Carolina, 10.2, and for the latest German Sickness Society experiences, 9.8 days."

The report also states that the principal diseases responsible for the sickness registered were rheumatism, organic disease of the heart, tuberculosis of the lungs, diseases of the kidneys, and diseases and conditions of the puerperal state.

It also states: "The proportion of cases of sick less than one month up to the date of the survey was only 26.3% of the total. This was slightly higher than the finding for Rochester,



N. Y., but considerably lower than the proportion of cases sick less than one month in North Carolina. The relatively small number of cases of the acute infectious diseases accounted for this condition.

"Of the total cases 72.9% received medical attention; this is a higher percentage than that developed in the preceding surveys. This finding reflects the excellent medical facilities available in the city of Boston. Hospitals and dispensaries provided a large proportion of the total amount of medical care."

The report shows also that among the males 19.9 persons were sick for each 1000 exposed; the figure for females was 19.5 per 1000. Sickness involving disability for work occurred at a rate of 18.1 per 1000; the same rate of sickness was observed for females.

Tuberculosis of the lungs was found in 82 cases, or at the rate of 84.3 per 100,000, and the report states that this is the lowest tuberculosis rate so far discovered in the several surveys. The report adds, "The medical care of tuberculosis cases is apparently well developed in Boston."

According to the report the city of Boston was chosen for the survey "because of its large and representative population, its geographical location and its varied industrial activity. The appointment of a Special Commission on Social Insurance by the Governor of Massachusetts to report on health insurance among other matters, suggested the possibility that our findings for Boston might be especially useful to this body in its studies. Finally, the excellent medical facilities of Boston, including hospitals, dispensaries, a well-developed nursing association and other health and social agencies, confirmed our decision to make our study there. It was hoped that the facts developed by our inquiry might be put to practical use by placing data obtained at the disposal of these institutions."

## Correspondence.

### WORKINGMEN'S COMPENSATION.

November 9, 1916.

Mr. Editor:—

Apropos of the report of the Committee on the Workingmen's Compensation Act in this week's *JOURNAL*, it may interest the members of the Massachusetts Medical Society to know that, on June 9, 1916, a man testified, under oath, before the Industrial Accident Board, that he was so busy doing surgical work at an industrial plant that he did not have time to make the customary report of accidents to the Industrial Accident Board. When asked why he did not send accident cases to a doctor, he said that he was doing dressings under the direction of the attorney for the company.

This special law violation was brought to the attention of the State Board of Registration in Medicine some six months ago, but evidently the welfare of the workman and the medical profession is of small concern to this Board.

That it is a common occurrence for unauthorized persons to practice surgery and medicine throughout the state is evidenced by the statement of the attorney of the insurance company at the hearing previously alluded to, that trained nurses treated cases for them right along and that they had no complaints. The man above mentioned, by the way, is not a trained nurse.

The "old line" companies are, as a rule, treating the local physicians well, but the mutual companies are resorting to the most unfair methods, both as regards the injured workman and the doctor.

A scheme which the two mutual companies work together is to have a dispensary inconveniently located. When a man is injured, he is directed to go to this place, often miles from the factory where the man is injured. The man usually gets sick of the treatment and the time lost in visiting this dispensary. He goes to his family doctor. If the family doctor tries to collect a fee from the insurance company before the Industrial Accident Board, the insurance attorney will say: "You can't beat Dr. So-and-So"—mentioning a very prominent surgeon,—giving the Board the impression that the insurance companies' cases are treated individually by this surgeon, when, as a matter of fact, the same surgeon does scarcely any of that work at all.

I think that the doctors have had about enough of the so-called state and mutual companies. Instead of furnishing regularly qualified physicians to treat their injured workmen, they have used nurses, social workers, ex-painters—anything to save a few cents—with the result that the afflicted workmen fall back on the family doctor and the doctor cannot collect a cent from the insurance companies because the companies furnish a dispensary to cover the law, or, rather, to evade the law.

It was most fortunate that the Legislature allowed the standard insurance companies to write insurance under the Workingmen's Compensation Act. Physicians would be in a sorry plight today had all this business, as was first intended, been taken over by the state company. I can imagine a chain of cheap dispensaries over the state with a corps of nurses and orderlies, operated from headquarters.

There is great room for improvement in the enforcement of the Medical Practice Act. A great many people think that nerve is more necessary than knowledge and a license to practice medicine in Massachusetts, and I don't know but that it is true.

Very sincerely,

CHARLES MALONE, M.D.

5 Glen Road, Jamaica Plain, Mass.

### AMMONIUM SALICYLATE IN POLIO-MYELITIS.

November 10, 1916.

Mr. Editor:—

I have now much corroborative proof that salicylate of ammonium, given in sufficient doses, at the inception of infantile paralysis, is of great practical value. It is, as yet, the simplest, least objectionable remedy offered. It interferes with nothing else that is rational. No doubt Dr. Lovett's admirable work is most desirable when paralysis has occurred; but why not prevent it, or, at least, greatly diminish its severity?

Please read "Grip in Children," *Journal American Medical Association*, Oct. 28, 1916 and discussion which follows, and you will agree with me that there is to be found not a little that is illuminating.

Theories of disease are one thing; practice, based upon long and varied experience, is another. I have never seen in grip or gripe, any drug so valuable as the salicylate of ammonium; and allow me to add, my experience has been neither small nor restricted.

Very truly yours,

BEVERLY ROBINSON, M.D.

New York, 12 West 57th St.



## HARVEY'S JOURNEY TO PADUA.

Mr. Editor:—

The following incidents concerning the life of Harvey are from a most interesting volume entitled "Physic and Physicians: A Medical Sketch Book, Exhibiting the Public and Private Life of the Most Celebrated Men of Former Days, with Memoirs of Eminent Living London Physicians and Surgeons." This work was published anonymously in 1845. It contains much of great interest concerning famous medical men that has not found its way into more formal biographies, and one can see that the writer must have had a vast store of knowledge to draw from. It would be impossible to hold the engaging author to "strict accountability" for all his statements, but they seem to ring true.

"When I was at Padua in 1787," says Dr. Mosley, "I looked for the arms of the great Harvey among the multitude which adorn the public hall of the University, but his were not there. There were several of the English of his standing. It was the custom at Padua for every person who had taken a doctor's degree to have his arms and name hung up in the University when he went away. After such a lapse of time it was not likely that I should obtain any anecdotes concerning him at Padua, but I did not omit to enquire. Among other things on which I could obtain no additional information was the tradition of the extraordinary preservation of his life in the commencement of his journey to Padua, in which there appeared an interposition of something more than human intelligence.

"When Harvey arrived at Dover, with several other young men, in order to embark for the Continent on their way to Italy, they went, with their passports, to Sir Henry Brook, then commanding at Dover Castle. When Harvey presented his passport Sir Henry told him he should not go, but must remain his prisoner. Harvey desired to know the reason and what offence he had committed. The Governor replied that it was his pleasure, and gave him no further satisfaction. In the evening, which was beautifully clear, the packet sailed with Harvey's companions on board. In the night there arose a terrible storm in which the vessel was lost, and all on board perished.

"The next day the melancholy news was brought to Dover. The Governor then explained himself to Harvey, whom he knew only by sight. He told him that on the night before his arrival he had a perfect vision of him in a dream, coming to Dover to cross over to Calais, and that he had a warning to stop him. Great and glorious indeed was the use which Harvey made of a life so miraculously protected!"

Harvey was a great martyr to the gout, and his method of treating himself was as follows: He would sit with his legs bare, even if it were frosty, on the leads of Cochine House, where he lived for some time with his brother Eliah, or put them into a pail of water until he was almost dead with the cold, and then he would betake himself to his stove. He was troubled with insomnia, to cure which he would rise in the night and walk about his chamber in his shirt until he began to shiver, and then he would return to his bed.

Very truly yours,

WILLIAM PIERCE COLES, M.D.

Boston, November 6, 1916.

## APPOINTMENTS.

CORNELL UNIVERSITY.—Dr. Lewis Atterbury Conner, professor of clinical medicine in the Medical College of Cornell University since 1905, has been appointed professor of medicine, in succession to Dr. William Gilman Thompson, who has resigned.

UNIVERSITY OF ILLINOIS.—Dr. Julius H. Hess has been appointed professor of pediatrics and chief of the division of pediatrics in the College of Medicine of the University of Illinois.

UNIVERSITY OF TENNESSEE.—Dr. Frank Maltauer of Cincinnati, Ohio, has been appointed associate professor of bacteriology and public health at the College of Medicine of the University of Tennessee.

HARVARD MEDICAL SCHOOL.—Dr. Leverett D. Bristol, formerly professor of bacteriology and hygiene at the University of North Dakota, has been appointed to the Boston Dispensary Fellowship in public health in the department of preventive medicine at the Harvard Medical School.

UNIVERSITY OF PENNSYLVANIA.—Dr. Joseph McFarland has been appointed professor of pathology; Dr. John C. Heister, professor of anatomy; Dr. George H. Meeker, professor of chemistry; Dr. Horatio C. Wood, Jr., professor of pharmacology and therapeutics; and Dr. Seneca Egbert, professor of hygiene in the medical faculty in the University of Pennsylvania.

## NOTICE.

HARVEY SOCIETY.—The third lecture in the twelfth series before the Harvey Society will be delivered at the New York Academy of Medicine on Saturday evening, November 25, by Dr. Paul A. Lewis, of the Henry Phipps Institute for Tuberculosis, on "Chemotherapy in Tuberculosis."

## RECENT DEATHS.

DR. STERLING BARROWS, a graduate of the College of Physicians and Surgeons, Columbia University, in 1906, died at his home in Worthington, Mass., August 16, 1916, of tuberculosis. He was a Fellow of the Massachusetts Medical Society.

DR. CHARLES EDWIN STONE died of cardio-renal disease at the Lynn Hospital, November 5, 1916, aged 48 years. He was a graduate of the University of Vermont, College of Medicine, in 1906, and had practiced in Lynn. He was a Fellow of the Massachusetts Medical Society.

DR. PERCY GUY DAVIS died at his home in Deerfield, Mass., Oct. 20, 1916, aged 49 years. He was a graduate of the Baltimore Medical College in 1896, and practiced ophthalmology, with an office in Greenfield, Mass. He joined the Massachusetts Medical Society in 1899.

DR. JONATHAN HENRY WOODS died at his home in Brookline, November 16, aged 65 years. He was born in Barre, Mass., was a graduate of the Long Island College Hospital in 1880, and of the College of Physicians and Surgeons, Columbia University, in 1881. He settled in Brookline, and joined the Massachusetts Medical Society in 1882. He was a member of the American Medical Association. His widow survives him.

## SOCIETY NOTICE.

NORFOLK DISTRICT MEDICAL SOCIETY.—A regular meeting of the Society will be held at Masonic Temple, 171 Warren Street, Roxbury, Tuesday, Nov. 28, at 8 p.m.

Business.

Communication, "Milk and Milk Production," illustrated by stereopticon, Reginald W. Bird, Waveney Farms, Framingham, Mass.

Discussion opened by W. W. Howell, M.D.

BRADFORD KENT, M.D., Secretary.



# The Boston Medical and Surgical Journal

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## Original Articles.

### A CLINICAL STUDY OF THE SECRETIONS OF THE DIGESTIVE TRACT.\*

BY THOMAS R. BROWN, M.D., BALTIMORE.

It might seem almost a work of supererogation to present a paper on digestion in this city—the home of Cannon, through whose brilliant studies we have been led to a real appreciation of the significance of the motor functions of the gastro-intestinal tract. Based on these and other studies, no one can fail to realize that in the interpretation of symptoms and of signs in digestive physiology and pathology, the study of the motor sphere plays the predominant rôle, and, in fact, in many clinics the secretions are not studied at all, the entire attention being devoted to the radioscopic and radiographic study of the digestive tract, as by many it is felt that this is all that is necessary and that the study of gastric, pancreatic and intestinal secretions adds little, if anything, to the appreciation of the underlying pathological process. We feel that this is a very wrong as well as an unfortunate point of view: we believe that these secretory studies not only add to our physiological knowledge in such cases, but furnish data of value both in diagnosis and treatment, and in our paper this evening we shall briefly review our work of the past few years on the digestive secretions, in support of this viewpoint. We shall discuss in turn our studies on (a) the saliva, especially as

regards the relationship between it and the gastric juice, (b) the relation of pepsin and rennin, and of pepsin and hydrochloric acid in the gastric contents, (c) the significance of the absence of hydrochloric acid in the stomach, (d) the study of the soluble proteid contents of the gastric juice in the diagnosis of gastric carcinoma, (e) the gastrogenous diarrheas, (f) the quantitative estimation of the pancreatic ferments in stool and urine, (g) the diagnostic value of the diminution or absence of the pancreatic ferments in the stool, (h) the pancreatic secretion in achylia gastrica, (i) the influence of jaundice upon the pancreatic function, (j) the effect of radium upon the digestive ferments, and (k) ferments of the small intestine. Lack of time will prevent us from discussing other questions of almost equal interest—the gastric secretions in visceroptosis, certain problems associated with hyperchlorhydria, etc.

It would take us much too far afield to discuss the complicated question of the nature of the ferments, their properties, chemical and physical, the nature of their reactions, the question of their specificity, and their reverse action; and yet we must call attention briefly to the latest views held regarding them, as these must be properly understood before one can arrive at a proper interpretation of the findings.

In considering the action of enzymes, certainly the most helpful view is that ferment and substrate occupy the same relationship as toxin and antitoxin, lysin and antilysin, with its specificity of action due to its haptophore group.

The intimate connection between gastric discharge and the flow of bile, pancreatic and duo-

\* Read by invitation at the Peter Bent Brigham Hospital, April 11, 1916.



denal secretions is, of course, well known. We know that vagus impulses cause the initial psychical gastric juice, and also increase pyloric tonus; that the control of the pylorus is fundamentally due to the acid in the gastric contents and that of the first portion of the duodenum—in the former causing opening, in the latter closing—and that the latter seems to be the stronger reflex of the two; we realize that the differential discharge of different foodstuffs is, in the main, explicable upon the rapidity with which the acid reaches the pylorus and duodenum; and that fats inhibit both secretion and pyloric tonus.

Certain facts are not so easy to explain: the rapid discharge of water and of egg-white, the rapid emptying in achylia gastrica, etc. We have shown in dogs the importance of the tonic effect of the fluid in this connection, hypertonic fluids leaving the stomach much more slowly than isosmotic or hypotonic.

As regards the pathological gastric secretion, we know that its absence or diminution is associated with a low degree of pyloric tonus, which accounts for the reflux of duodenal contents in achylia gastrica and after fat feeding. The pancreatic secretion is under both psychic and chemical control, the former easily shown in dogs with pancreatic fistula, secretion beginning from one to one and a half minutes after the ingestion of food, and even after the sight or smell of it, and lasting for from ten to thirty minutes. The alkalinity of the juice not only furnishes a medium suitable for the action of its ferments, but also plays a large rôle in the pyloric reflex.

The important ferments of the pancreas—diastase, lipase, and trypsin-zymogen—are, according to many investigations, secreted in varying amounts, according to the character of the food; other ferments have also been described—a rennin, a haemolysin-zymogen, a nuclease. Bickel has shown that the pancreas is subject to secretory variations analogous to those seen in the stomach, Wohlgenuth the opposing action of the pancreas and the suprarenals, and we the primary stimulating and secondary inhibiting effect of bile upon this secretion. It is conceivable that the pancreatic secretion may be brought about through nervous channels, as Pavlov believes, by the direct action of substances preformed in the food or the products of digestion, or by a hormone, the last being unquestionably the major cause under physiological conditions. This is formed by the conversion of the prosecretin found in the duodenal mucous membrane into secretin by the action of hydrochloric acid, while a similar stimulant action follows the administration of water, fats, and soaps, the two former producing a very faint, the latter a fairly strong secretion, possibly due to another secretin—saprokrinin; while the action of fat is probably reflex, not hormonal.

Probably activated through secretin, and also possibly through nervous channels as well, the

bile also plays an important part in duodenal digestion, not so much from its ferments—as, with a possible faint trace of diastase and of a proteolytic enzyme, it has none—but by its activating influence upon trypsin, diastase, and especially lipase, and its large rôle in aiding the absorption of fats by change in the physical as well as the chemical status of the medium, largely through the influence of bile-salts, which diminish surface tension and dissolve fatty acids, soaps, lecithin, and cholesterol, these bile salts being probably reabsorbed and again acting as stimulants of hepatic secretion. While the secretion of bile seems to be continuous, its elimination is, according to most observers, largely dependent upon the same mechanism as that of the pancreatic and duodenal secretions—secretin.

It is interesting to remember that in the duodenum under physiological conditions the simultaneous presence of the three juices necessary for a complete duodenal digestion is insured, in the main, by the same mechanism, although in the intestinal juice there is also probably a new secretin which may cause renewed flow after absorption. On the other hand, direct mechanical stimulation of the duodenal mucous membrane causes a secretion, while there is the possibility of a psychic and reflex secretion as well. The duodenal juice is alkaline, but less so than the pancreatic secretion.

One has but to mention the ferments present in the duodenal secretion or in the wall of the gut to realize the extreme complexity of the chemical and physical processes carried on here. Besides the prosecretin—not a ferment, of course, but of fundamental importance in the calling forth of ferments—we have erepsin, enterokinase, arginase, nuclease, lipase, maltase, invertase, lactase, a slight trace of diastase from Brunner's glands, a haemolysin, and a glucoside and a cellulose-splitting ferment. The fact that extracts of the wall are much richer in ferment than the juice itself, notably in the case of erepsin and the inverting ferment for the conversion of di- into mono-saccharides, suggests that a considerable part of the ferment action takes place as the substances pass through the wall, the time for which, according to Heidenhain, takes at least several minutes. Of these ferments the most interesting, perhaps, are erepsin, which is also present in many tissues of the body and which accelerates the digestion of the end-products of peptic action, and the enterokinase which converts the inactive trypsinogen into active trypsin.

Prosecretin seems to be present in the whole thickness of the mucous membrane, the enterokinase in much greater abundance in the cells covering the villi. While there is no absolute proof of it, it is probable that the same selective tendencies as regards the character of the food ingested is met with in the duodenal secretion as in the pancreatic flow, with the same possi-



bilities of qualitative and quantitative functional variations.

Certainly, ferments are almost, if not quite specific in action, and in many cases are capable of reversible action, are soluble in water, precipitated by alcohol, absorbed by various substances, such as charcoal, kaolin, etc., have an optimum temperature and an optimum reaction of the medium in which they act, are destroyed by heat, are in some cases met as ferments, in other cases as pro-ferments or zymogens. In their study the greatest accuracy of technique is essential, for extremely slight variations in reaction or temperature of medium may produce enormous variations in the activity of the ferment, and certainly many of the conflicting reports in this field of work are due to a lack of appreciation of this fact.

Perhaps a brief enumeration of the digestive ferments is advisable before reporting our findings in this field. Of the ferments which act upon proteids we meet the pepsin-zymogen of the fundic portion of the stomach, activated by the hydrochloric acid normally present in the gastric content; the rennin found either as ferment or zymogen in gastric juice and to a much less extent in pancreatic and small intestinal juices; the trypsin-zymogen of the pancreas activated by the enterokinase of the small intestine; the erepsin of the pyloric mucosa and of the mucosa and secretion of the intestine, converting peptones into amino acids; the autolytic ferments of the liver and other organs and tissues, the alpha- and beta-proteases of Jacoby, probably of fundamental importance in intermediary metabolism; ferments acting upon the carbohydrates, the diastase of the salivary glands, pancreas and, to a very slight extent, of the small intestine, and the invertase, maltase, and lactase of the intestinal juice and mucosa; the fat-splitting ferment or lipase mostly from the pancreas, but also present in small amount in gastric contents and intestinal juice, and peculiarly activated by the bile salts; and certain other ferments of great interest, although present in but small amount, whose function is not quite so well understood, such as arginase, nuclease, certain ferments acting on the purin bases, and various oxydases, such as aldehydase, tyrosinase, and possibly certain reducing and glucoside-splitting ferments.

Although, according to most observers, the large intestine secretes no enzymes, Wakabayashi and Wohlgenuth claim to have demonstrated erepsin, a peptolytic ferment, and fibrin ferment. One must never forget, also, that not only in the leucocytes, but also in bacteria, many ferments are found which may duplicate the action of the normal enzymes, and also the fact that a similar effect may be produced by various metals in colloid form, which, incidentally, has been utilized in the treatment of malignant neoplasm by the injection of colloid selenium or colloid copper, based mainly upon Wassermann's experiments.

#### (a) *The Relation Between the Salivary and Gastric Secretions.*

We have been especially interested in a group of cases of stomatitis, gingivitis, and glossitis—erosions or superficial ulcerations of gums or tongue or buccal mucous membrane, usually associated with absence of hydrochloric acid in the gastric juice, and singularly resistant to treatment, which by no stretch of the imagination could be regarded as oral manifestations of the two diseases in which sore mouth is so frequently found—sprue and pellagra. With Dr. Freeman, we have studied the saliva in 47 cases to determine whether there was any relationship between the character of the saliva and of the gastric juice, our method being to collect all the saliva produced by the chewing of a piece of rubber of definite size, shape and weight for 20 minutes, always, of course, a long time after the patient had taken food. Our series comprised 10 normal cases, 6 of subacidity, 10 of achylia, or, properly speaking, achlorhydria, 6 of which showed changes in the mouth, tongue, or gums, and only one associated with malignancy, and 15 of hyperacidity or hyperchlorhydria; determining the total amount of saliva, its reaction, and the amount of diastatic ferment. The normal average amount was 22.5 c.c., the average alkalinity, 4, while the diastase ferment, measured by its ability to digest soluble starch, was always present, though showing rather wide variations. The results of our studies showed that as regards quantity of saliva, its reaction and richness in ferment, changes in the gastric secretion have no appreciable effect; in other words, there is no definite relationship between the character of the gastric juice and of the saliva, and, therefore, that it is highly improbable that changes in the saliva play any considerable part in the development of glossitis, gingivitis and stomatitis so frequently met with in cases of gastric achylia. These results were probably to be expected, as month and stomach comprise between them, as it were, a complete secretory apparatus, the former furnishing diastase, the latter, pepsin, rennin, and lipase, and thus are quite analogous to the two secretory apparatuses of a lower level—the pancreas and the small intestine, each with its complete set of ferments to digest all types of foodstuffs. We are now, therefore, determining whether there is any relationship between the saliva and the pancreatic secretion.

Interesting from a physiological point of view was the demonstrated fact that the chewing of bland substances, stimulating neither to the senses of smell nor of taste, produced a flow of saliva quite rich in diastatic ferment,—a view rather opposed to the general physiological opinion. It is also an interesting fact that some of these cases of sore tongue or sore mouth are relieved by the administration of muriatic acid, or pancreatin, or both.

In the very recent studies in this field the ap-



proach has usually been from the other side, that is, the influence of the saliva upon the gastric secretion. Sticker showed that deficient salivary activity is followed by arrest or diminution of the hydrochloric acid secretion, while Biernacki and Schard showed that it was not the saliva *per se*, but its combination with food, that stimulated gastric secretion. We did not study the peptolytic ferment or substance of the saliva which is capable of splitting glycytryptophan.

(b) *The Relation of Pepsin and Rennin, and Pepsin and Hydrochloric Acid.*

There has been much discussion as to whether pepsin and rennin are separate ferments or are identical. Pawlow and many of his followers holding that they are identical; Heidenhain and perhaps the majority of workers believing that they are separate and distinct ferments, the more recent work of Rüttimeyer, Einhorn and Laporte agreeing with this latter view. Of course, there are many arguments in favor of their being different, as, for example, that pepsin acts only in acid, rennin in acid, neutral or slightly alkaline media, and the variation in the viability of the two ferments. Dr. Schnack has carried on under our direction a series of experiments in this connection, estimating pepsin by the Mett method, rennin by the Boas procedure, hydrochloric acid by the use of Toepfer's reagent, and the total acid with phenolphthalein as indicator in a series of 51 cases, the gastric contents being either that aspirated after the ordinary Ewald test meal, or from the fasting stomach. These studies show beyond question that although, as one would expect, the pepsin and rennin content are parallel in most cases, nevertheless there are so many exceptions to this as to prove clearly that the production of one enzyme may be suppressed or increased without affecting the production of the other; in other words, demonstrating that pepsin and rennin are separate enzymes.

Incidentally these studies also show that there is no relationship between the amount of pepsin and of the free hydrochloric acid or the total acid content,—a fact we have also demonstrated in many cases of achylia as well as hyperacidity, in which cases we have employed the edestin method for the estimation of pepsin in preference to the Mett method. We have always felt that the hydrochloric acid as secreted in the stomach is always of constant percentage, but that the pepsin richness may vary.

(c) *The Significance of the Absence of Hydrochloric Acid in the Gastric Contents.*

We realize that the term achylia gastrica is very loosely used, for, as we noted before, although of a large series of cases studied by us that showed no hydrochloric acid, in the majority the pepsin was absent, in some it was present even in normal amount. Roughly speaking, we use the term to mean no hydrochloric acid in

the gastric contents after the ordinary test meal with a total acidity under 12 or 15, and with a hydrochloric acid deficit, although Rehfuess by his fractional methods of study insists that in some of these cases free hydrochloric acid may appear in the gastric contents long after the usual time of extraction of the meal. It was not many years ago that the absence of hydrochloric acid was considered, if not diagnostic, at least extremely suggestive of gastric carcinoma. To realize the error in this point of view and to show that in the vast majority of cases achylia is associated with benign conditions, one has but to mention its presence in a large series of cases. Let us briefly enumerate some of the diseases in which it is frequently found, drawing only from our own cases. We must realize, of course, that it may represent the late stage of an inflammatory process, or an atrophy of the mucous membrane, or a lack of functional activity of the glands, either due to a pure neurosis, to psychic disturbances, to a toxæmia, or to a reflex inhibition from elsewhere, as, for example, the achylia frequently met with during menstruation.

The conditions in which we have met with an absence of hydrochloric acid with peculiar frequency or of especial interest are:

1. The last stages of a chronic gastritis.
2. Gout and arthritis deformans, or perhaps better called chronic infections arthritis, leading in the first case to the substitution of an acid for an alkaline therapy, and in the latter to the belief held by many in the intestinal origin of the disease.
3. Various infectious diseases—tuberculosis where it is often found, and typhoid fever, in the latter of which in a number of cases we have found a complete achylia following the disease, which may be one of the causes of the gastrointestinal symptoms often met with, which is probably toxic in origin and not due to destructive changes in the glands, as in many cases after a considerable period of time, in several of our cases more than a year, there was a gradual return to normal gastric juice, and in all these cases the use of hydrochloric acid therapeutically should be advised; sinusitis, pyorrhoea alveolaris—a very frequent cause, probably leading to a true infectious gastritis and being the most potent factor in the gastric dyspepsia and diarrhoea in older people—and tonsillitis.
4. Various intestinal parasitic diseases, especially infection with the uncinaria,—hook-worm disease,—though frequently found in infections with tapeworm, round worm and entamoeba.
5. Conditions associated with chronic passive congestion, notably chronic nephritis and myocardial disease.
6. Pernicious anaemia, a group of peculiar interest because of the resemblance of the symptoms to gastric cancer, and because of the view



held by some that the anaemia is secondary, the gastro-intestinal condition primary.

7. Pellagra and sprue—in the latter associated frequently with a concomitant absence of pancreatic secretion, and in each disease a marked improvement of the digestive symptoms often following the administration of hydrochloric acid, in association with pancreatic ferment in the case of sprue.

8. Cancer, not only of the stomach but often of other organs even outside the abdominal cavity, especially in the late stages of the disease.

9. Diseases of the thyroid, and here both in Graves' disease or hyperthyreosis, and myxoedema or hypothyreosis it is often found and is probably the cause of the marked diarrhoea which may be the only symptom of the former disease.

10. Linitis plastica, or cirrhosis of the stomach, probably representing in most cases the conversion of an old ulcer into a malignant condition with marked hyperplasia of the fibrous tissue and very little cellular participation.

11. High grades of ptosis and atony of the stomach, although here hyperacidity or normal acidity may also be found.

12. Chronic gall-bladder disease with and without jaundice where we have found it in a very considerable proportion of cases, and where it may prove of real aid in diagnosis.

13. After sudden shock, violent emotions, worry and overwork.

Truly a large group of cases and very interesting, as it makes one realize under what various stimuli—infectious, toxic, nervous, etc.—the condition may develop, and how difficult it may be to differentiate the true underlying condition. Unlike many others we have not found the presence of pepsin in large amount of much value in differentiating the purely functional from the organic achlorhydrias, for in a large series in which the pepsin was estimated quantitatively by the edestin method we found in the great majority of cases, both functional and organic, the practical disappearance of pepsin *pari passu* with that of the hydrochloric acid. As to the effect of the absence of hydrochloric acid this is very varied, and in many cases difficult to explain, as, for example, the fact that in certain cases it is associated with a diarrhoea, in others with constipation, and in still others with a normal bowel habit. After all, to appreciate what the absence of hydrochloric acid may bring about we must always keep in mind its multiplex functions—its action upon the pyloric sphincter; its rôle in converting the inactive prosecretin into the active hormone of the pancreas, secretin; its disinfecting properties; its rôle in the digestion of the proteins; the essential part it plays with pepsin in the digestion of connective tissue, and its activating power upon the zymogens of pepsin and rennin.

(d) *The Study of the Soluble Proteid Contents of the Gastric Juice in the Diagnosis of Gastric Carcinoma.*

Boas said a few years ago "attempts to make an early diagnosis of cancer of the stomach are useless—we should be satisfied to make a correct late diagnosis." Perhaps our x-ray brethren will not agree to this, but with a few brilliant exceptions we feel that this dictum is still unquestionably true. Correct diagnosis of late cancer is often very difficult if we have not a palpable tumor, and if we realize, on the one hand, how in a large proportion of cases the growth originates behind the left costal arch on the lesser curvature and is not palpable until a considerable portion of the stomach is involved, and, on the other hand, the very slight diagnostic significance of the lack of hydrochloric acid and even of the presence of lactic acid and of the Oppler Boas bacilli, the diagnostic difficulties are very apparent. Most of these special tests are based on the assumption that the cancer cell in its growth or in its disintegration develops a proteolytic ferment which carries the cleavage of the proteid molecule further than normally met with in gastric digestion. Some of these tests have proven singularly disappointing, as the glycyltryptophan test, for we now know that the saliva contains a substance, possibly an enzyme, which can also split up this substance, while the more complicated tests of Saxl and Salomon, and especially of Salkowski—the increase of the colloidal nitrogen in the urine in gastric cancer—are not only too difficult for ordinary clinical study, but, according to our experience, have proven singularly unreliable, far more so than the strictly biological tests, such as the increase of the antitrypsin in the blood. We have for the last few years been much interested in the simple method devised by Wolff and Junghans for determining the amount of soluble proteid in the gastric juice by adding a solution of phosphotungstic acid to graded dilutions of filtered gastric juice, a significant increase being suggestive of gastric carcinoma. The test, however, is obviously only applicable to those cases with no free hydrochloric acid, and is, therefore, not of value in the early diagnosis of the disease. From tests made upon over 200 cases of benign and malignant achlorhydrias in which one could judge with a fair degree of success the correctness or incorrectness of diagnosis either by the operative findings or by the subsequent course of the case, in over 85% the tests gave a correct interpretation of the condition—a large enough percentage to warrant its use as a routine procedure in all doubtful gastric cases associated with achlorhydria, and agreeing in practically all details with the results of Smithies' much larger series from the Mayo Clinic.



(e) *Gastrogenous Diarrhoea.*

No more interesting group of digestive cases can be found than that of the gastrogenous diarrhoeas, that is, cases of diarrhoea associated with a complete lack of hydrochloric acid in the gastric secretion. It is extremely difficult to determine why some of these cases of achylia are associated with diarrhoea, others not, for in all cases the food must enter the intestines in an unprepared form, in all the bacteria-content of the stomach and upper intestines must be higher and in all the pylorus tends to remain open; and yet the result of therapy and the study of the stool demonstrate that these cases are not purely intestinal in origin. We have been especially interested in this group in determining by the method to be mentioned later whether or no the diarrhoea was due to an associated disturbance of pancreatic function, but a careful quantitative estimation of the pancreatic ferments in cases of achylia, with and without diarrhoea, showed that this is not so (as suggested by Gross of Vienna, but opposed by Ehrmann of Berlin), and, therefore, some other mechanism must come into play. Perhaps in these cases the hydrochloric acid acts as one link in a chain,—a link to be used over and over again in the production of a hormone which has as its object the inhibition of the motor function of the intestine; for the reaction is not a quantitative one, small doses of hydrochloric being quite as effective as large. There is really no more brilliant therapy than the treatment of these gastrogenous diarrhoeas with small doses of hydrochloric acid—to see the symptoms in a case with intractable diarrhoea of years' duration, often of the morning type, disappear with return to a normal stool habit after a few doses of the acid, is almost incredible; and yet this happens in most cases, although obviously to get permanent results the acid must be administered regularly and sometimes indefinitely. Unquestionably certain of the diarrhoeas met with in pernicious anaemia, nephritis, tuberculosis, typhoid fever and its convalescent period, pellagra, sprue, and various neuroses are of this type, and often are markedly helped by acid therapy.

(f) *The Quantitative Estimation of the Pancreatic Ferments in Stool and Urine.*

Pawlow and his followers have shown in dogs the definite quantitative response of the pancreatic secretion to food stimuli, while Wohlgemuth and others believe that they can also demonstrate a qualitative response at least as regards the carbohydrates. Although incapable of absolute experimental proof it is highly probable that similar conditions exist in man, that is, that there is a definite relationship between the amount and possibly the type of food ingested, and the amount and character of the pancreatic response. Of course, if such conclusions are

true, it is essential for clinical purposes that a normal be established.

We have studied quantitatively the diastase in the feces in the hope that by establishing the normal limit, especially the low normal, we might have criteria of value in the diagnosis of organic or functional diseases of the pancreas, determining whether or no in such diseases a definite variation from the normal is constantly found. We have chosen the diastase in preference to the trypsin or lipase because of its greater stability, because of the marked proteolytic action of the bacteria, much more striking than their diastatic action, because practically all the diastase that is secreted into the intestinal tract arises from the pancreas, the amount from Brunner's glands and gall-bladder, the only other sources, in all probability being practically negligible and because it is a preformed ferment and does not require an activator.

We have attempted to devise a method which is simple, practical and exact, and based on physiological principles, and by applying the same method to normal and pathological conditions to draw comparisons of value in diagnosis. In practically all the diseased conditions the diagnosis was verified by operation.

Of course, a great many methods have been suggested as qualitative and a few as quantitative tests of the pancreatic function—Sahl's glutoid capsule, Müller and Schlecht's gelodurot capsule, the study of the stool for large amounts of meat and fat (creatorrhoea and stercorrhoea) after the Schmidt diet, the Volhard method of obtaining the duodenal contents from the stomach by administering olive oil by mouth and the examination of the fluid for the pancreatic ferments, Ehrmann's palmitin test, Einhorn's intubation of the duodenum, A. Schmidt's nuclei test, the Cannidge reaction, and the alimentary glycosuria test. None of these is definitely quantitative, however, and for this purpose the estimation of the pancreatic ferment in the stool suggests itself. Of these ferments the trypsin and lipase are more easily destroyed by bacteria, each requires activation to show its maximum efficiency, the former by enterokinase, the latter by bile; and the proteolytic action of the intestinal bacteria may complicate the findings very markedly.

Of course, in all such estimations the salivary diastase—identical in action with that from the pancreas—must be eliminated, but this is easily done by administering a food in liquid form in which the act of chewing is not called into play. Of the other ferments found in the small intestines—crepsin, peptolytic ferment, nuclease, lipase, fibrin ferment, hemolysin and glucoside-splitting ferment—none appreciably affects the action of the diastase. This action, of course, is the conversion of starch to maltose, the intermediary products being soluble starch, erythro-dextrin, achrodextrin, and isomaltose.

As for the methods described for studying the diastase in the stool to determine the pan-



creatic function, most are based on the same principle,—the conversion of starch into lower products which do not give the characteristic starch reaction with iodine or the determination of the sugar produced by this cleavage by Fehling's solution or some other reagent. Roberts, Strasburger, Wohlgenuth and Ed. Müller—all describe such methods; the results, however, are open to serious criticism because they used different foods and various or no laxatives, and thus rendered possible enormous variations in the diastase content of the stool. Diarrhoea always increases the stool diastase, constipation lessens it, while Ury has shown that of the purgatives, senna really increases the secretion of diastase, while the bitter waters and bitter salts have no such effect. It would seem wise, therefore, to choose a bitter salt as a laxative of choice in these investigations. Enriquez, Ambard, Binet and Durand reported a number of cases in which the digestion of starch was measured by the quantitative estimation of the sugar formed. We, however, regard the Wohlgenuth test for diastase as far more practical than the quantitative estimation of the sugar formed, and quite as free from criticism on theoretical grounds. No discussion of the ferment content of the stool would be complete without a reference to the very extensive and interesting studies of Crohn in this direction. In the case of both duodenal fluid and stool he gives a table of normal variations for the three ferments,—lipase, trypsin, and diastase,—and of these three, he believes trypsin is the most constant. He believes that the method lends itself to prognosticating qualitative and quantitative variations in the strength of the pancreatic external secretion.

In the methods employed by us in determining the normal amount of diastase in the stool, we have tried to eliminate as far as possible all sources of error, and so to standardize the different steps that mistakes would be reduced to a minimum. The patient is given a high enema the night before, the evening meal being a very light one. At 7 A.M. the next day, 750 cc. of milk is given, at 7.30 A.M. and again at 8 A.M. 1-2 an ounce of Epsom salts ( $Mg SO_4$ ), and at 8.30 A.M. a glass of water containing 1-4 of a teaspoonful of bicarbonate of soda. All the stool up to 2 P.M. is saved in a vessel containing two ounces of toluol, and kept on the ice or in a cool room. If less than 400 grammes or cubic centimeters of stool are obtained, an enema of a pint of water is given, as in our experience between 400 and 1100 cc. of stool is the amount to be expected in the individual case.

Barring the inevitable possible mistakes always associated with the gathering of specimens, the possible sources of error are psychic variations in the different patients, differences in their intestinal bacterial flora and variations in the motor functions of their stomach and intestines, but we believe these inevitable sources of

error are reduced to a minimum by the method employed.

Of course, the condition of the salts in the stool has also a distinct effect in activating or depressing the diastatic action, but we do not believe that if our technic is strictly followed out it is necessary to dialyze the stool and make our studies from the desiccated specimen.

Preservation of the specimen in a very cold place or on the ice, and the immediate examination of it after the entire specimen has been obtained, is imperative because of the marked effect of variations in temperature upon the ferment, and also because by allowing it to stand we are introducing two variable factors—changes in the ferment due to temperature and chemical changes in the medium and the influence of the varying bacterial flora upon the ferment; and, secondly, the diastatic action of the bacteria themselves. We believe that the wide variation obtained in certain of the investigations is dependent upon the lack of insistence upon certain of these points, and that with a rigorous technic figures as to normal limits are of real value.

From our study on the diastase content, and to a less extent upon the trypsin, of the stool in normal conditions we feel justified in concluding that the stool, if a rigorously exact method is carried out, furnishes a ferment content within definite limits (600 units being the low reading of 20 normal patients in the case of diastase).

While, of course, realizing that this method is not especially esthetic, nevertheless we feel that it is more truly quantitative than the study of the duodenal contents, for in the latter case, there are far too many variable factors, especially the difference in the time the bucket enters the duodenum, and the consequent difficulty of determining at what phase of pancreatic digestion the fluid is obtained, and the varying admixtures of bile and duodenal secretion.

We have also estimated the diastase of the urine in normal and certain pathological conditions, the total amount in the 24 hours varying in health from 15 to 120 units. As to the value of the estimation of the urinary diastase diagnostically, the study of a number of cases of pancreatic and renal diseases has made us feel that the two main reasons why it is not diagnostic of pancreatic disease are, first, because of the widespread distribution of this ferment in the body and the possibility of a vicarious increased activity of other sources of supply in the case of pancreatic disease; and, second, because in various renal diseases there is usually a marked lessening of urinary diastase due to deficient renal permeability. For these reasons, while a persistently low diastase content of the urine if the kidneys are normal is suggestive of pancreatic disturbance, yet the normal figures in our series should prove of far more value in the study of the renal function.



(g) *Diagnostic Value of the Quantitative Study of the Pancreatic Ferments in the Stool.*

Recently we have been standardizing the tryptic ferment also in the stool, although for various reasons it is not so satisfactory as the diastase, especially because it is secreted as a zymogen, and because the end reaction is marked by a white precipitate instead of a sharp color change; nevertheless, so far the findings have usually harmonized with those obtained in the study of the other ferment. In regard to lipase our results have not been satisfactory, possibly due to the fragility of the ferment and the enormous variability of its action due to the varying bile-content of the stool. We have used our method especially in the study of carcinoma of the pancreas and chronic pancreatitis. In the case of the former, carcinoma of the pancreas, we have made the diagnosis in ten cases, subsequently verified by operation or by autopsy, some with jaundice and some without; and the diagnosis was correct in all the cases. In each case there was still no evidence of starch digestion in the tube of least dilution corresponding to twelve grammes units (600 units being low normal), lower dilutions not being studied as we felt that the limit of error had been reached and that we could say that there was practically no diastase in the stool. Enriquez, Ambard and Binet found no diastase in two cases of cancer of the head of the pancreas, verified by autopsy, and Durand none in one case probably malignant.

The only stool in all our studies, except those of carcinoma of the pancreas, in which we found a complete absence of pancreatic ferments was from a typical case of sprue of more than a year's duration, and in this case no one factor played such a large rôle in the symptomatic cure as the administration of pancreatin by mouth, although even now when the patient is clinically well, and has gained over 50 pounds in weight, a return of the diarrhoea may be brought about by withholding the pancreatin for a few days, and the stool studies still show that normal pancreatic ferments are wanting.

Although we have had no such case in our series we should always remember one other condition in which no pancreatic ferments are found in the stool—complete closure of the pancreatic duct or ducts by stone, etc.; in these cases, if the condition is acute, we usually find a marked increase of diastase in the urine.

We have found a diminution but not absence of diastase and trypsin in 11 cases of pancreatitis (true pancreatic cirrhosis as verified by operation), in chronic gall-bladder disease associated with jaundice, and in chronic infectious or wasting diseases of long duration. Ehrmann reported a case of chronic pancreatitis with marked diminution of diastase in the stool, and Durand 3 similar cases. It would thus seem, that in cases of chronic pancreatitis pancreatic

ferments while present in the stool are markedly diminished.

We feel, therefore, that if all the controllable factors are standardized, the study of the diastase and trypsin content of the stool should be of real value in the diagnosis of pancreatic disease, especially carcinoma.

(h) *Pancreatic Secretion in Achylia Gastrica.*

According to Starling, "the formation of hormones and their circulation through the blood to the reactive tissue suffices to account for the whole activity of the pancreas, and it is doubtful whether in this activity the nervous system plays any part whatsoever"; this hormone, secretin, of course, being produced by the action of the hydrochloric acid of the gastric contents upon the prosecretin of the duodenal mucous membrane. If this were so, there should be practically no pancreatic ferment secreted in true cases of achylia gastrica, for the accessory rôle in stimulating pancreatic secretion played by water, fats, fatty acids, soaps, peptones, alcohol, sodium chloride, lipoids, and lecithin is minimal. To see whether or not this is so,—in other words, to test Starling's view,—we have made very careful quantitative estimations of the diastase and in some instances of the trypsin in the stool in 7 cases of true benign achylia gastrica, for if it is the action of the free hydrochloric acid upon the duodenal mucous membrane which practically alone calls forth the secretin of the pancreas by converting prosecretin into secretin, then in those cases without hydrochloric acid in gastric contents there should be a marked diminution of pancreatic secretion. In three of these cases, there was a persistent diarrhoea of long standing—a true gastrogenous diarrhoea, while in the other 4 cases the bowels were normal or costive. Our findings were that there was absolutely no diminution in 6 of the 7 cases, while in one case only were the ferments diminished, and then very slightly, thus showing that in the absence of hydrochloric acid some other mechanism is employed to call forth pancreatic activity,—a view also held by Ehrmann from his qualitative studies of the duodenal contents obtained by aspiration of the stomach after oil feeding. After all, the well-known fact that there is a psychic secretion of pancreatic juice, and the numerous observations of Pawlow and others would make one feel, as our results also show, that in pathological conditions at least, and possibly also normally, if the results of Pawlow's and Fleig's experiments are properly interpreted, there is a nervous as well as a humoral method of pancreatic secretion.

(i) *The Influence of Jaundice upon the Pancreatic Secretion.*

We have neither time nor space more than to touch upon certain other findings of interest in the study of the digestive ferments. In study-



ing the effect of jaundice, artificially produced in dogs, upon the pancreatic secretion we arrived at the following conclusions: first, after the ligation of the gall duct and the consequent production of a rapidly developing jaundice there is a marked reversal in the pancreatic juice both as regards amount and ferment richness after the different types of foods; there is more juice with milk than with meat, and where before the trypsin or the diastase showed a definite increase, now a decrease is likely to be met with, and vice versa; and, second, the removal of the bile from the intestine after the previous withdrawal of the major portion of the pancreatic secretion produces in a very short time a rapid loss of weight and strength, ending in sudden death, and emphasizes anew the great importance of the bile as a partial substitute for the pancreatic secretion if the latter is absent or markedly diminished. On the other hand, different conditions obtain in chronic jaundice, and here we find, as we have shown in many cases in human beings, a marked lessening of hydrochloric acid and pepsin in gastric contents, and of diastase and trypsin in the pancreatic secretion. The effect of acute jaundice upon the pepsin curve of secretion has been shown by Glube as similar to our pancreatic ferment curves.

(j) *The Effect of Radium upon the Digestive Ferments.*

A few years ago when radium and radio-active waters were suggested as cures for many and varied ills, it seemed of interest to study the effect of the emanations upon the digestive ferments. In our first series of experiments we used radio-active substances from various sources, such as radium lead and radio-active ores, while in our second series, carried on several years later with our assistant, Dr. Hendry, we used extremely radio-active water artificially prepared and kindly furnished us by Dr. Burnam from Dr. Kelly's supply. In our first series of experiments the influence of the radio-active substances was extremely slight, and our conclusions were that none of the radium preparations seemed to have any effect upon the autolytic ferment of the liver, although this ferment was activated by lead chloride solution; with diastase the very radio-active D.E.F. possessed an inhibiting effect, while the radium D from emanations had a slight stimulating effect, increasing with the length of time and the amount of fluid used, this ferment being also markedly activated by various salts; with pepsin we found a slight inhibiting effect more marked with the very radio-active D.E.F. although slight in comparison with the inhibiting effect of saturated lead chloride solution.

In our second series of experiments on pepsin, trypsin, lipase and diastase the only effect noted was a very slight inhibition in a very few cases; in the majority of cases no effect whatsoever;

our findings thus agreeing with the more recent work of Gudzent and Stoklasa, and in direct disagreement with the earlier work of Bickel, Bergel, Wohlgemuth, and others, who reported a marked activating influence upon various ferments, including the autolytic ferments of the liver, diastase, trypsin, pepsin and glycolytic ferment.

Certain incidental findings were of interest in these studies of ours, as, for example, the remarkable influence of the reaction and of the salt content of the fluid, and the peculiarly stimulating effect of certain inorganic salts, notably, of lead chloride upon that most interesting of ferments,—the autolytic ferment of the liver, first described in 1876 by Salkowski, of great importance in the intermediary metabolism of proteins; verified by Neumeister, Magnus-Levy, and Jacoby, and, according to the last investigator, consisting of two ferments, an alpha- and a beta-protease. This finding suggests a possible explanation for the action of the so-called alteratives, potassium iodide, etc.

(k) *Ferments of the Small Intestine.*

We have done practically no work upon the numerous and interesting ferments of the small intestines—lipase, diastase (in minimal amount), maltase, lactase, invertase, enterokinase, erepsin, arginase, nuclease, rennin, mucinase, and the various oxydases and reductases described by some, except in an occasional case to verify Ury's findings,—that after certain of the laxatives and purgatives, notably senna, they are considerably increased; but we feel sure that, notwithstanding the difficulties met with, these ferments furnish a very fertile field for study in the hope of elucidating many of the complex problems of intestinal digestion, with the probability of a definite differentiation of a number of quite separate conditions now loosely grouped together under the vague term of intestinal indigestion.

*Conclusions.*

In this short paper we have attempted to present, although of necessity briefly and incompletely, the results of some of our studies upon the secretions of the digestive tract—studies carried on in the main in the interspaces of a busy clinical life,—laboratory cases, as it were, in the desert of practice; and from this presentation we trust that we have shown that the neglect of the study of the secretory side is most unwise if we wish to have a broad conception of the diseased process in many and varied interesting digestive conditions. From these studies it seems justifiable to draw certain conclusions, some of purely physiological, others of clinical interest. Of the former the most interesting were the demonstration of the lack of influence of the gastric secretion upon the character of the saliva; the fact that a saliva rich in diastatic ferment is secreted during the chewing of most substances, stimulating neither to the



senses of taste nor smell; the independence of rennin and pepsin, the lack of definite quantitative relationship between the pepsin and the hydrochloric acid of the digestive juice, and the proof that in the absence of the normal mechanism of pancreatic stimulation some other mode of calling forth the ferment of this gland, probably nervous in character, is called into play.

From the clinical side, although also of physiological interest, the conclusions which seemed to us to be of interest are the large number of conditions in which an absence of hydrochloric acid in the gastric juice is met, and the importance of the appreciation of this fact both diagnostically and therapeutically; the significance of an increase in the soluble proteid of the gastric contents in the diagnosis of gastric carcinoma; the importance of recognizing the group of gastrogenous diarrhoeas, and the brilliancy of their treatment with hydrochloric acid; the fact that with a rigorous technic there are low normal limits to the quantity of diastase found in the stool, and that an absence of these ferments is very suggestive of cancer of the pancreas.

Thus, although never losing sight of the greater importance of the motor sphere in digestive pathology, and recognizing that the appreciation of motor disturbances is absolutely essential both as regards diagnosis and therapy, nevertheless we feel and also trust that we have shown, that the study of the digestive secretions is not without value; that from it we obtain an insight into the physiology and pathology of digestion not obtainable from motor studies alone; that without this study, many of the most interesting problems in the digestive sphere would remain unsolved or misinterpreted, and that, therefore, it is both unscientific and short-sighted to eliminate from our diagnostic methods the study of the secretions of the digestive tract.

## PSYCHIC AND NEUROPSYCHIC AFFECTIONS IN WAR.\*

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It is only since the South African War, and especially since the Russo-Japanese War, that the psychoses and neuropsychoses of war have begun to be recognized and studied.

Among the principal points emphasized by the Russian psychiatrists, such as Jacoby,

Chaikewitch, Serge Soukhanoff, Oreretzkowsky, Vladitchke, Ermakoff, Antokratow, and Cygietrejech, or by the English, such as Stewart and Kay, may be cited: First, the great frequency in modern wars of cases of psychoses and psychoneuroses,—a frequency such that the Russians had to establish at Kharbine and at Moukden, in Manchuria, psychiatric hospitals. Second, the predominance of acute, often transitory, psychoses and neuropsychoses clinically analogous to those resulting from severe accidents. Third, the particular multiplicity of cases of this sort following maritime battles. Fourth, the necessity of psychiatric care for armies on campaign, consisting of improvised hospitals in regions sufficiently remote from the base of operations and from the passage of troops.

The facts revealed by the Russo-Japanese War did not attract sufficient attention. I had, nevertheless, endeavored in my teaching of military psychiatry, and in the latest three editions of my text-book, to point out their nosologic and practical importance.

From the nosologic point of view, I insisted, with Jacoby, on this fundamental characteristic, namely, that "modern land and naval battles by the suddenness, extent and horror of their ravages, act more and more in the manner of cosmic catastrophes, such as earthquakes, which may determine genuine epidemics of psychic disturbance. As in great collective disasters, in fact, one sees terrified and distracted soldiers fleeing automatically, disoriented, unconscious, sometimes hallucinated, no longer knowing what they are about, a prey to those new forms of disease akin to the traumatic and hysterical neuroses of industrial origin." In confirmation, two of my pupils, Laurès and Hesnard, published interesting observations establishing the fact that the psychoses, following the explosions of the *Jena* and the *Liberty*, had manifested themselves especially under the form of mental confusion, or of hysteropathic mental accidents. From the practical point of view, I had insisted, equally with Jacoby, on the organization of a special psychiatric service in case of war. "This is a first step in the course of the psychiatric assistance of armies on campaign. We must hope that the question will not rest there, and that the example given by Russia will be followed by all nations, today especially, when the European people are exposed to very severe and protracted wars.

"The solution adopted by Russia, of special hospitals for the insane improvised at sufficient distances from the field of operations, is certainly the best. In case of need, even special pavilions annexed to ordinary field hospitals would suffice, on condition that their medical direction was entrusted to specialists. The psychoneuroses or psychoses from moral shock, which predominate in great cataclysms and great battles are, in fact, in the large majority of cases, essentially acute, transitory, and curable in a few days. On the other hand, no treat-

\* This article represents a translation of fragments from an original and hitherto unpublished manuscript prepared by the author in November, 1914, as a report to the French Minister of War from the Psychiatric Clinic of the Military Hospital at Bordeaux, France.



ment is better suited to the acute psychoses of all forms than rest in bed. One might, therefore, I repeat, in default of special hospitals, attach pavilions for the insane to the ordinary field hospitals. These pavilions would serve at the same time for the traumatic insane and for the post-operative, who would evidently be more numerous in the circumstances of which we speak.

"It is an organization of this sort which Professor Simonin of Val de Grâce also recently urged in his conference of December 13, 1912, with the federal union of reserve and territorial physicians, on psychoses of wartime and psychiatric aid in the field."

Real war broke out before the psychiatric aid which we had been urging for nine years had yet been organized. I cannot say whether the English, Russian, German and Austrian psychiatrists with whom my colleague Taetzel and I had discussed this question of military psychoses at the International Congress on the Treatment of Insanity, at Berlin, in 1910, have practically solved this problem, or in what way. It would be of importance to know this, for already, in recognized works, military physicians, such as Stier of Berlin, Drastich of Vienna and Kay of Bristol, had insisted on the treatment of mental diseases during the war.

Be that as it may, from the beginning of hostilities in August, 1914, Dr. Pouchet, director of the health service of the eighteenth district, understanding the necessity of doing something in this regard, established the care of cases of psychoses and psychoneuroses among soldiers in a central psychiatric service, supplied by patients coming from other sanitary organizations of the district, who were informed by circular. This central service is located at the military hospital at Bordeaux, directed by my colleague and friend, Dr. Salesses.

The cases which I have observed up to this day, December 31, 1914, to the number of 150, may be divided into two principal categories. First, the cases of psychoses in soldiers who have not been under fire,—ordinary, common psychoses, merely supervening on the occasion of war (disequilibrations, degenerations, alcoholism, general paralysis). Second, psychic and neuropsychic affections in soldiers returning from the front and induced directly by battle. Of the former group there were 62 cases, of the latter 88. It is this latter group of cases which I wish to examine briefly in the present study.

#### I. PSYCHIC AND NEUROPSYCHIC DISTURBANCES IN BATTLE.

Of 88 cases of psychic and neuropsychic disturbances in battle which I have hitherto observed, 50 are properly psychic and 38 neuropsychic.

##### PSYCHIC DISTURBANCES.

Traumatic psychic disturbances, whether proceeding from a moral, purely emotional trauma-

tism or from a physical traumatism, are represented essentially by symptoms of mental confusion with or without hallucinatory oneirism, that is to say, by the exact symptoms which characterize the psychoses of intoxication and of infection.

This opinion, which is in accord with the facts observed by the Russian psychiatrists in Manchuria, and with those resulting from the explosion of the cruisers *Jena* and *Liberty*, or from the recent earthquakes in Sicily, is again confirmed by the facts of actual war, in which the two principal psychic disturbances established by us have been, hallucinatory oneirism and mental confusion.

#### Hallucinatory Oneirism.

Hallucinatory oneirism has never been lacking in the 88 cases affected with psychic or neuropsychic disturbances following battle. In this regard, I may remark that there are very few wounded returning from battle who do not dream more or less of the fighting. I have questioned a large number at random and the majority, even those whose sleep was absolutely calm before, have declared that on their return from the front, and for several nights at least, they have had dreams of this sort. This is very natural and need occasion no surprise, but it is not a question of ordinary dreams without pathologic character. The morbid dream, which alone constitutes oneirism, begins only when it imposes itself as a reality,—when the sleeper really lives it,—and this oneirism, which we see participates in the second stage of hypnosis, may, like it, pass from the dumb dream to the dream in action. It is of this living dream, this hallucinatory oneirism only, which I wish to speak.

It has never, I have said, been absent in our patients with psychic and neuropsychic disturbances. The events and incidents of the battle which serve as its theme are variable. There is the bursting of shells, the shrapnel, the fusillades, the charges, the evolutions of the aeroplanes, the life in the trenches, the spectacle of the wounded and of the dead. Sometimes the scenes are multiple in the same patient, and this is most frequently the case. At other times the scene is single, always the same, and it consists then in a habit of painfully living over again the terrifying circumstances of the wound or of the emotion of shock.

The degree of hallucinatory oneirism varies equally among its subjects. Sometimes the vision is simply painful and transitory. Sometimes it seizes the sleeper to such degree that he literally lives it and it continues even into the day in what has been properly called a prolonged dream. Several of our patients of this grade wave their arms, seem agitated, and talk in their dreams, allowing significant exclamations to escape.

If the intensity of this hallucinatory oneirism marks the profound influence of the emotions



of a battle on soldiers, it contributes, for its own part, by a sort of delayed shock, to maintain in a high degree the impressionability of its subjects. Happily its action is only temporary, the duration of the hallucinatory oneirism itself being but transitory. I have rarely seen it last more than two weeks, even in the most acute cases. Ordinarily it disappears at the end of several days, after which, sleep again becomes calm and restorative.

Under the circumstances and conditions of examination it has been impossible for me to verify here the clinical law of the relation between the urine curve and the oneiric curve which we have previously established, but in various instances I have been able to establish the diminution of the total amount of urine in patients at the acme of the oneirism and its augmentation continuing to the crisis, to the moment of the disappearance of the psychic disturbance.

I think I have no need to add that the hallucinatory oneirism of soldiers returning from fire has nothing to do with ethylism. All my patients, or practically all, were absolutely sober. I think, moreover, I have made due allowance for this error, too long a time having elapsed for painful, terrifying occupational nocturnal hallucinations to be the characteristic index of alcoholic intoxication. In reality, they may manifest themselves exactly thus in any metabolic disturbance of the organism, produced either by an intoxication or by any sort of infection, or, what seems equivalent, by an emotional shock.

An interesting fact in this regard is that since the declaration of war, hallucinatory oneirisms of battle have appeared, not only among soldiers who have actually been present at combats, but also among alcoholics, whether soldiers or not, who have remained at their homes or in garrisons. A territorial, a chronic alcoholic, came to me at the psychiatric clinic of the military hospital with a note from Major Guérin, giving the details of his nocturnal hallucinations. He saw automobiles arriving, then a German army of 200,000 men, and, in the rear, Russians and French, as well as some Russian vessels. He was then present, he said, at a battle. He fired at the Germans as well as at some aeroplanes. He then saw the domestic animals of his farm.

These hallucinations, which lasted three or four nights, occurred notably at the moment when this territorial was in camp near a railway. He declared, even on coming to himself, that he had really fired at the enemy and at the aeroplane which he saw, but had fired blanks, since he had no cartridges.

However it may be, one sees that the events of war and of battle may supervene among alcoholics, even non-combatants, to give a special form to their oneiric hallucinations. This is only a further example of a very general fact that the events of the moment often intervene

among the insane, to orient and color their delirium and their hallucinations.

### *Mental Confusion and Amnesia.*

Together with hallucinatory oneirism, the predominant syndrome in the psychic disturbances which we are studying is the syndrome of mental confusion. Although constituted by its habitual elements of obtusion, disorientation, amnesia, agitation or torpor, this mental confusion differs in certain points from the type which supervenes, for example, in the course of acute infections. It has a sudden onset like the traumatic cause which produces it; it is not habitually of long duration; and it manifests itself above all by the symptom of amnesia, which is its essential characteristic. The mental confusion produced by battle, therefore, is one of the mental confusions of amnesic type like that of insolation, of polyneuritis and of eclampsia.

Accentuated though the amnesia may be, and exclusive though it may appear in such a case, it does not, however, represent the entire morbid state; it always attaches itself to a mental confusion, perhaps little apparent on account of its slight and transitory manifestations of obtusion and disorientation, but nevertheless real. It even coexists often, as we shall soon see, with hallucinatory dreams, that is to say, with the oneiric element of mental confusion.

The amnesia of cranial traumatisms, like that of insolation or of grave infections, has well-known characteristics. In its typical form it is at the same time lacunar, retrograde, anterograde and actual.

The amnesia which results from battle may present itself under classic aspect. In slight and moderate cases it consists above all of an impression of recollections which extends to a greater or less period from the time of the traumatism, and from the consecutive time. Except for the cases accompanied by loss of consciousness, it is not a complete night, but a more or less sombre twilight and dysamnesia, rather than an amnesia.

That which has appeared to me above all to characterize the amnesia following battle, and to differentiate it in some way from similar amnesias, is that it presents a singular tendency to manifest itself in the complete or total form.

Total amnesia, that is to say, that which extends over the entire life and allows nothing to remain in the subject's mind,—neither his name nor his birthplace nor his age nor his profession, nothing, in a word, of the events through which he has previously lived,—is extremely rare.

I have just observed three very clear cases of this condition among soldiers returning from battle,—two officers and an adjutant profoundly shocked, but not wounded. On their arrival, all three were incapable of furnishing the slightest information about themselves or their families. The adjutant, who had come from Cambrin in a



state of extreme lebetude, which slowly dissipated, was totally ignorant about himself and when he was asked, for instance, if he were married, he looked at his wedding ring and said, "I must be, because here is my ring."

This total amnesia creates in the patients a strange situation from which they suffer more or less acutely. The adjutant cited above reflected, scratched his head when he was questioned and then replied in an irritated tone, "That tires me. I feel that I am going mad."

It is a curious thing that when all the recollections of existence have disappeared there is one which may survive, namely, that of the event which produced the shock. Sometimes even the recollection of this event crystallizes itself in some fashion in the brain, and objectivates itself there to such an extent that from being an agonizing and almost an hallucinatory fixed idea by day, it becomes at night a terrifying hallucination, reproducing itself always during sleep.

Besides the cases of mental confusion and amnesia with more or less marked hallucinatory oneirism, I have observed much more rarely other psychoses among men returning from battle: four cases of anxiety of the melancholic type, four cases of maniacal excitation, and five cases of delirium of vanity among the sick, consisting in auto-attribution of ranks and of imaginary decorations or in circumstantial inventions, notably infallible procedures for the destruction of hostile trenches, with the desire to present the invention to the commander-in-chief or to the minister of war, and with a distrustful fear of being dispossessed of it; but even in these subjects there existed the amnesia and the hallucinatory oneirism, which specifically constitute the fundamental psychic disturbances.

### *Etiology.*

The very minute etiologic investigation which I pursued in every case demonstrated that in psychoses of battle, as elsewhere, the predisposing causes did not lose their effects.

The predisposition observed in patients affected with mental confusion and hallucinatory oneirism is not an hereditary predisposition. We shall see in the second part of this study concerning the ordinary psychoses, that the sons of the insane and alcoholics and, even more, those who had previously had an attack of insanity, have especially fallen or relapsed into illness either at the declaration of war, during the time of mobilization, or in the early days of their service, that is to say, before being under fire. It appears that there was a first selection natural and realized immediately among those who were hereditarily predisposed. On the contrary, there are very few of these predisposed subjects among those returning from the front who have passed under my observation. These were merely disoriented persons whom the first agitations of the early war had not been sufficient

to render insane, or for whom to do so required the shock of battle itself. Such notably were those affected with trench delirium, to whom I shall make future reference.

The individuals in whom the psychoses of battle have supervened, were almost all, and above all, emotionally predisposed, impressionable, nervous, even neuropathic, of whom two had previously had nerve crises of the hysteric type.

This particular predisposition, a true emotional constitution, in my opinion, dominates and illuminates the etiologic mechanism of the psychoses of battle, which are, then, essentially psychoses of emotional origin. This is proved not solely by the habitual existence of the emotional predisposition among the patients, but also by the existence of emotional shock as a principal and constant occasioning factor.

*A priori* one would be tempted to believe that this occasioning cause must be the physical traumatism, the wound and the consequences of every sort which it may entail. This is not so. Of my 50 patients only 22 had been wounded, the 28 others had not received any wound or contusion. On the other hand, not one of them had been without moral and emotional traumatism.

Moreover, the reaction is not delayed and the psychic disturbance appears rapidly, brusquely, either under the form of confusional agitation, driving the patients to rush unconsciously in all directions, sometimes even towards the enemy, crying out and brandishing their rifles, or under the form of inert, passive, catatonic stupor with sometimes more or less profound reactions on the organism.

I observed only a single case of psychosis of truly surgical origin in a man with a wounded hand, with suppuration and fever, who, during this complication, some time after his return from battle, presented an hallucinatory battle delirium with slight symptoms of confusion. The delirium disappeared immediately after incision, and extraction of the bullet. That which provoked the psychosis, therefore, or rather the psychic disturbances of battle, as we have seen and observed them, is essentially an emotional shock of the most violent type in impressionable individuals of a nervous temperament. Of course, physical and moral fatigue, long marches, perpetual alertness, the insomnia of life at the front, prolonged inactivity in the trenches, are all circumstances which, by diminishing the resistance of these subjects, favor the action of emotional shock. It is the same with antecedent diseases, particularly, of course, the intoxications and the infections, latent or chronic, such as ethylism, paludism and tuberculosis. The richest and most durable hallucinatory oneiric delirium that I have observed, was that of two officers affected, one with malaria, the other simultaneously with malaria and tuberculosis.

It is not without interest, from the point of view of age and military status, to remark that of our 50 patients, 29 belong to the reserve,



8 to the active force and 13 to the territorials, and that of this number, there were 35 private soldiers, 10 officers, two adjutants, two sergeants and a corporal. I may add that of the three affected with total amnesia, one was an adjutant and the other two were officers. It appears then, without establishing percentages, that the psychic disturbances of battle affect preferably men of the reserve and show themselves intense, especially in the amnesic form, among officers.

#### *Diagnosis, Prognosis and Treatment.*

The important point of diagnosis concerning the psychoses of battle consists in differentiating them from the ordinary psychoses, that is to say, from the manias. This diagnosis has a capital importance, for it involves at the same time prognosis and treatment.

If it is a question of mania, the attack is serious. It will be long, perhaps inenarrable, and necessitates the commitment of the patient. If, on the contrary, it is a question of a psychosis from mental shock in the form of mental confusion, amnesia, or onerive hallucinatory delirium, the cure is almost certain in a relatively short time and there is no need of commitment, except in extraordinary cases, and if it is a question, for instance, of manic-confusional associations.

From my point of view, it is a serious error, capable of doing great harm at the same time to the patients and to the army, to regard these cases indiscriminately as insane, and to commit them all without observation and previous examination to an insane asylum. These patients, who are but momentarily overturned by an emotional shock, are no more truly insane than those who present stupor, confusion or transitory delirium under the influence of typhoid fever, pneumonia, uremia or a surgical traumatism.

One has no right to inflict the grave measure of commitment on officers or soldiers who return from battle in a temporary state of confusional torpor, or of terrifying hallucinatory onerism, and who, some weeks later, perhaps, will be in a condition to resume their place in the ranks. That is why, in modern wars, particularly in one so severe and so long as the present, there is need of a military psychiatric service. I do not know whether such a service exists elsewhere, but it should do so, for its importance is capital; moreover, it would be easy to organize, even if only in a simple and rudimentary fashion as at Bordeaux.

It would be sufficient, in my opinion, at least for the moment, to establish a psychiatric centre at the military hospital at the seat of each division of the health service. This psychiatric centre, wholly analogous to the delirious wards existing at Bordeaux and Paris, or to the neuro-psychiatric services established in 1900 in the marine hospitals, should be composed primarily like them of several cubicles or isolation chambers for the violent requiring observation, and

an open ward for the calm and inoffensive. These two parts of the service, the cubicles especially, should be, so far as possible, on the ground floor and not far from one another.

This central service should receive not only subjects with psychiatric disturbances from the military hospital itself, but also those of the temporary and auxiliary hospitals of the city and of the neighboring regions. As for the wounded, they may, according to the nature and degree of their psychic disturbance, either remain in surgical wards, or go on to the psychiatric service and there be dressed by the hospital surgeons.

It is indispensable to entrust the psychiatric service to a specialist, supported by at least one assistant and by a competent personnel of attendants whom he shall train. The mobilization, which has placed at the disposition of the directors of the health service a large number of psychiatrists, would greatly facilitate this arrangement.

The function of the physician in these regional centres of psychiatry is at once delicate and manifold. It consists essentially first in receiving all soldiers affected with disturbances predominantly psychic, observing them, and establishing a diagnosis at once rapid and exact; second, in referring without delay to the neighboring insane asylum those affected by mania, by the common psychoses arising on the occasion of war; third, in treating and curing as quickly as possible those capable of rejoining their commands in a few weeks and in forming, on the other hand, a suitable decision in the cases of those more severely affected, particularly those presenting confusional associations.

It may happen that the psychiatric service would receive with the label "psychic disturbance," soldiers attacked by acute infectious diseases. Personally, some time ago, I relieved five in the course of typhoid fever, of whom two came from more or less distant military hospitals in a fairly grave general condition. One ought not to impose a journey on a typhoid patient, especially from one department to another, because he is delirious.

As for the diagnosis between an attack of insanity and a delirium symptomatic of acute infectious disease, the differentiation is relatively easy. It is sufficient to recall that one must think of something other than insanity, and consequently employ every measure of diagnosis every time that a delirium breaks out abruptly; if it presents itself under the form of mental confusion and nocturnal hallucinatory onerism; if it reaches its maximum quickly with stupor or agitation; if it is accompanied by diminished urinary secretion; and finally and above all, if there is fever.

It is obvious that the specialist in charge of the central psychiatric service should, at the same time, fulfill the functions of expert in the war council of the region, these functions being in time of war more important and active than



ever. It is thus that affairs have been organized at Bordeaux since the beginning of hostilities.

## II. NEUROPSYCHIC DISTURBANCES.

The neuropathic disturbances of battle are not easily separated, it appears, from psychic disorders properly so called. Just as the latter, in effect, as we have seen, are accompanied by neuropathic disturbances, notably hysteroid crises, so the neuropathic disturbances are accompanied almost constantly, especially at the outset, either by a certain degree of mental confusion or hallucinatory oneirism or, more often still, by fixed ideas, obsessions and phobias. It was thus in the case of the 38 patients who passed under my observation. On the other hand, these neuropathic disturbances have, in themselves, the closest relations with the psychic condition. They deserve, therefore, the denomination of neuropsychic disturbances under which they are here designated.

Epilepsy is rare. Neurasthenia is more frequent, especially among officers. Already existing or predisposed, it manifests itself with them under the most typical form of exhaustion neurosis with physical and psychical adynamia, apathy, aboulia, and nosophobia. Several of these officers were already fatigued before the war, exhausted by long residence in colonies, and their potential was in advance incapable of enduring the exceptional expenditure of strength required. Some gave way from the outset, manifesting a most vexatious inertia; others, after having given all that they could, sometimes with great brilliancy, collapsed in absolute exhaustion, incapable thenceforth, and ashamed of their incapacity.

As for hysteria, alone or associated with neurasthenia, it is this, or at least that which we are accustomed to classify under this nosologic label, which has largely dominated the scene. The most varied, unusual and peculiar cases may be observed: syndromes of tremor, trepidation, spasm, tic, convulsions, impotence, anesthesia, paralysis, urinary incontinence, blindness, deafness, mutism, somnolence, delirium, sometimes transitory and disappearing at the least suggestion, sometimes tenacious and resistant to the highest degree, accompanied, or not, by classic hysterical attacks recurring daily at the same hour. Almost always these manifestations were met in neuropaths of whom some had already previously had nervous accidents.

For the moment, I only note these facts, and will limit myself to speaking a little more in detail of another syndrome, which, from its frequency, its symptomatology and its relations, seems to me to constitute in some sort the type, or one of the types, of the psychoneuroses of battle. This syndrome is functional paraplegia or pseudoparaplegia.

## *Functional Paraplegia.*

My attention was first drawn to these facts by Inspector-General Delorme, who, on September 13, 1914, asked me to visit and examine at the temporary hospitals Nos. 4 and 78, directed by my colleagues, Drs. Bergonié and LaGrange, a subaltern and a soldier, presenting the effects of explosion, whose nature needed to be determined, this examination presenting great importance from the point of view of prognosis. Subsequently, I observed one after another, six analogous patients, and it is the result of this study that I wish here briefly to summarize.

From the point of view of motility, patients of this sort are all alike. They have at first a more or less complete disability of the legs, preventing them from walking, and even, in certain cases, from standing upright. Nevertheless, the majority have retained their muscular force, as one may determine, by the resistance which they are capable of offering to movements of flexion, or extension imposed on their lower extremities. They can, also, when extended on their bed, raise their feet to a certain height, when the pain which they feel in various points of the body permits it. Only one at his arrival had his legs absolutely inert, and was obliged to take them in his hands to swing them about.

The gait is characteristic. At first, the patients are obliged to lean on someone's shoulders in order to advance, their legs do not bear them, and if they are not supported, they stumble and fall. Then by degrees they succeed in holding themselves upright and, without their feet leaving the ground, dragging them one after another on the floor, supported by the sides of their bed and surrounding furniture, or on two stout canes, which they do not dare to give up, they walk very quickly with efforts of the trunk and arms to aid them.

Cutaneous sensibility is more or less diminished, especially in the lower extremities, where it is at times completely abolished.

The reflexes are variable. In a general way the tendon reflexes are preserved, sometimes even exaggerated, while the cutaneous reflexes, on the contrary, are very slight.

I have not observed in my patients either trophic disturbances or paralysis of the sphincters. In two, there occurred temporary anuria and obstinate constipation. There are almost always headache and variable pains, notably in the lumbar region and in the legs, increasing under the influence of attempts to walk and augmenting, in turn, when they are more acute, the difficulties of locomotion.

In seven out of eight cases, I was able to have an electro-diagnosis by Professor Sigalis and Dr. Nancé Penard. In all, the examination showed complete absence of reaction of degeneration; it showed qualitative modification of electric irritability and the existence of simple, qualitative variations, most often with diminution of faradic irritability for the muscles of



the antero-external region, either of one leg or of both, more rarely for the muscles of the thigh.

In fact, one does not observe in these cases any sign of organic lesion, and the diagnosis of functional paraplegia appears self-evident. This diagnosis, I insist, is applied solely to the category of cases which I have observed. Without doubt, there exist also, between the functional paraplegias and the organic paraplegias, mixed cases; that is to say, cases of association in diverse degrees of nerve alterations and of neuropathologic troubles, as is so frequent in neurology.

The evolution of the malady is ordinarily very slow. Either the disability continues to amend, but in a rather imperceptible manner, or else it remains almost stationary, with slight increases and diminutions, with moments of improvement followed by abrupt relapses on trifling cause, such as pain in the legs, in the back, in the head, or a simple obstinacy, with tendency in each one to adopt a mode of gait determined, and more or less invariable.

Of my eight patients, a single one rejoined his command, still not cured. Of the seven others, two are making progress, but still rise with difficulty from a chair and can hardly walk without support; four are better one day and worse the next; and one is still at the same point, and drags his feet on the ground as at the first day.

In short, incomplete cure in one case, very slight amelioration or almost stationary condition in all the others. This at the end of two months is the situation in my patients, in spite of the active internal and external treatment which has been employed with strychnine, tonics, massage, electrotherapy and hydrotherapy.

The etiology deserves here particular attention. One would be tempted at first to attribute the principal rôle to a special action exercised in the explosive zone of bombs, and an action produced either by the wind of the projectile or by the sudden displacement and rarefaction of the surrounding air, or by the liberation of toxic gases, or by the raising or throwing down of the body, sometimes even with loss of consciousness following and capable of determining true nervous alteration. I believe, in accordance with the facts which I have observed, that this is not the case; for besides the actual symptoms of the disease which make an organic lesion unlikely, there are other reasons of an etiologic nature, which in themselves would suffice to permit this diagnosis to be abandoned.

The principal one of these reasons, evidently perceptory, is that the patients affected with this form of paraplegia have not always been found in the explosive zone of a bomb. Two of our men, out of eight, had been merely and slightly wounded in the foot with a bullet. Moreover, in one of these cases, the paraplegia did not supervene until three weeks after his return from the front to the hospital, when his wound had almost healed. Nevertheless, the clinical

manifestations were identical in all the cases. There was the same characteristic disability of the legs and shuffling gait. We must, therefore, seek elsewhere, if not the sole cause, at least the principal cause for this singular syndrome.

This cause, in my opinion, admits of no doubt: it is, again, emotional shock. Not only has emotional shock never been absent in our patients, but one learns that in all it has played the essential rôle, whether they have been overcome by the nearby explosion of shell, or wounded by a bullet, whether overcome immediately, or after an interval.

A final proof establishes the certainty that these patients are the victims of their emotionality: it is that this same emotionality persists, and dominates the picture during the entire course of their disease. That is why, when they wish to walk, they hesitate, tremble and are apprehensive, as in the *astasia-abasia phobia*. It is that which, by reason of their suggestibility, holds them under the menace of a fixed idea of disability, of paralysis, of incurability, as in *sinistrosis*, of which cases of this sort are, at bottom, only a variety. It is this, finally, which in almost all determines, at the same time as the nervous disturbances, the more or less marked psychic disturbances of confusion, amnesia and hallucinatory *oneirism*. From this, one can explain perfectly the evolution of this functional paraplegia, entirely subordinated to the emotional mentality of the subjects, ameliorating or growing worse with it, capable even of prolonging and fixing itself indefinitely, when it is associated with some auto-suggestion, some underlying, fixed idea.

I cannot here pass over in silence the very interesting experiences of Dr. Moulinier, on the one hand, upon the prolonged apnea of vagotomized animals exposed to the action of a sudden detonation; on the other hand, upon the psychic and nervous disturbances presented by dogs subjected to the influence of a violent explosion. It is a peculiar fact that certain dogs present psychic and nervous disturbances, recalling those which we have just described, particularly *hebétude*, *pantophobia* and *sluggishness of gait in the hind legs not extending as far as paraplegia*. It is well to add that in these dogs, which died at the end of three or four days, autopsy revealed no microscopic lesion of the nerve centres, nor any organic disorder. Hence, the conclusion of the author, identical with ours, that it is highly probable that the disturbances observed are purely functional and develop only in predisposed subjects.

In conclusion, I believe that functional paraplegia following battle must be regarded as the effect of a violent emotional shock. It is to be recalled, moreover, that functional paraplegia of emotional origin is already known to pathology and that cases were cited, especially by Déjerine, Babinski and Sollier, in the course of the memorable discussion on the rôle of emotion in the genesis of neuropathic and psychopathic



accidents, which took place in December, 1909, at the joint session of the Societies of Neurology and Psychiatry, at Paris.

I may add that there is something comparable in confusional psychosis and particularly in the amnesia produced in the same conditions. These are, in my opinion, two morbid manifestations of the same emotional shock under the form of a phenomenon of arrest, of inhibition, with this difference: that one affects the psychic functions and the other the medullary functions, the two, moreover, as we have just said, being capable of co-existence.

What is difficult to explain is the reason why, when the emotional shock of battle acts on the system, it translates itself preferably into a functional paraplegia. One commonly says of an individual overwhelmed by a violent and sudden moral traumatism that the emotion has taken him off his feet. This familiar phrase is very exactly applicable here, but does not explain why the nervous shock of battle customarily and, so to speak, systematically, affects only the legs and not the arms.

Doubtless it is simply because intense emotions react particularly on the lower extremities in man, as in animals, by reason of their notably lower resistance to various inhibitory agents, but I am far from declaring, the more so since the number of cases which I have observed is small, that this is the rule, and that functional inhibition never affects the upper extremities.

There remain two points to examine. The first is that of the frequency of functional paraplegia as a neuropsychic accident of battle. I should be disposed to believe that this accident is relatively frequent, for it is by chance and without search that I have been able to observe eight cases. Moreover, three similar cases, wholly identical, have been referred to me by Dr. Moulinier, Dr. Drivet and Dr. Bernadon, bringing the number of observations of this sort to eleven.

I should not be surprised if this accident which, if I may judge by my cases, seems to be found chiefly in soldiers of the active force and in young reservists, were an accident of the beginning of the war, becoming less and less frequent in proportion to the marvelous adaptation of soldiers to the terrible effects and circumstances of war. The eleven cases of functional paraplegia which I have cited all date from the month of August or the beginning of September, 1914. Personally, I know of no more recent cases.

The second point to be examined is that relative to the disposal to be made of cases of this sort from the military point of view. This point, as was indicated at the outset by Inspector General Delorme, is very important, so important that, before inviting or advising a decision relative to soldiers affected with functional paraplegia, I have considered it a duty to follow them closely and for a long time. Even today,

at the end of three months, I am not decided and still hesitate.

Considering only the proved fact of so marked and so long a disability of the leg, which threatens to become permanent, a single solution seems to be imposed; namely, the workhouse. Regarding it more closely, things are less simple than they appear. Functional paraplegia due to emotional shock of combat is, I repeat, a true *sinistrosis*. Like *sinistroses* which frequently disappear after the decision of the court, it has, therefore, a great chance of disappearing also. This is vexatious, the more so, that among soldiers everything is known, repeated, and imitated and this, therefore, cannot fail to multiply cases of this sort, at least to influence their evolution and prognosis. What, then, is to be done with these cases? It would be very imprudent to endeavor, in spite of their non-cure, to send them back to the front, not merely because their condition would infallibly become aggravated there, but also because they are, at bottom, nervously predisposed and even if they supersensitize, if they add voluntarily or not to their morbid manifestations, are none the less sick, delicate, fragile, that is to say, for the greater part, soldiers of inferior quality.

On the other hand, one cannot think of keeping indefinitely in a military hospital where, in time of war, movement ought to be as rapid as possible, an unfortunate cripple destined in the end to weary the most enduring patience. Moreover, placing one of these nervous wrecks in a workhouse is liable to provoke imitators. How much more susceptible of contagion in an institution of *psycho-neuropaths*, the spectacle of this infirmity of so pitiable an aspect! I have proof that my patients make less progress the more one sympathizes with their disability, and proofs that, unconsciously or not, they react on one another; and I might cite those of my pseudo-paraplegics who have a nerve crisis for the first time after having seen a hysterical attack.

The best solution of this difficult medico-military problem would be that of parole under observation, like that adopted by the law in industrial accidents. But in time of war there is no leisure to wait, and temporary discharge, like renewable convalescence discharge, is not of a nature to solve the difficulty. Perhaps it would be best, after all, for the purpose of suppressing all possibility of *sinistrose* auto-suggestion created by the prospect of complete liberation, to keep these subjects in the army, giving them, if possible, an employment compatible with their morbid condition. It is obvious, moreover, that here, as always in medicine, it can be a question only of kind, and that each case, after examination, must be disposed of according to indications.

In conclusion, it should be said that subjects affected with neuropsychic disturbances should be separated from other patients and placed in



a special neurologic or neuro-psychiatric service, in accordance with local organizations, reducing to a minimum the chances of intermental action, that is to say, of reciprocal contagion.

## DRUG ADDICTION AND MODERN METHODS FOR ITS CONTROL.

BY SOLOMON H. RUBIN, M.D.,

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SINCE the federal and state governments have officially recognized the gravity of the narcotic-drug evil, and have enacted laws prohibiting and penalizing the indiscriminate sale and the habitual use of such drugs, the question of cause and the control of drug addiction came to the foreground.

The Harrison and state anti-narcotic laws have been responsible for the active and vigorous campaign against the habit-forming drug evil, the crusade being headed and conducted by local police and federal authorities. The conspicuous activity of these officials has overshadowed the real nature of the evil by lending to it a criminal aspect, thus branding narcomania with the stigma of crime and prescribing a penalty for the offence.

For years the drug menace has been permitted to flourish more or less unchecked until it has become so deep-rooted as to be ineradicable. Suddenly our legislators were awakened from their lethargy by the alarming spread of the addiction in this country, with the result that law upon law, intended to uproot the evil, has been inscribed on the statute books; all of which though well intentioned, have failed as yet to strike at the core of the trouble.

Although our laws forbid habitual indulgence in and the indiscriminate sale of habit-forming drugs, none provides a remedy other than the penal institution. As a result drug addiction has failed to attract the merited attention of the medical profession, which regarded it outside of its field of investigation, and unconsciously coincided with the penologist that drug-addiction is purely a social evil and should be dealt with by punitive measures.

Those who come in professional contact with the narcomaniacs are convinced that drug-addiction is a definite disease having a well defined symptomatology and an indefinite pathology. Indeed, the symptoms of abstinence in almost all cases appear with regularity, in classical order, and so constant as to constitute a definite disease condition which may be easily recognized by the train of symptoms it represents.

Granting, therefore, that we are dealing with

a definite disease, the question of susceptibility, cause, and treatment presents itself for consideration.

The question why men and women indulge in narcotic drugs is as yet unanswered. The combined researches of the psychologist, the sociologist, the alienist, and the criminologist have not been productive of a satisfactory explanation. It is said that men drink alcohol and indulge in narcotic drugs because they have an instinctive desire for some form of stimulation, and for the same reason indulge in tea, coffee, and tobacco. Not always are habit-forming drugs used to stimulate sluggish mental faculties or to slow down an overactive mind. In either case, when so used, the element of time and protracted use soon reduces, and ultimately destroys, the efficacy of the drug, both as a stimulant and as a depressant, and the individual takes it thereafter to maintain a normal mental and physical tone. Finding himself in the throes of a permanent habit, the addict uses narcotic-drugs as a connecting link to join the break, which his habitual indulgence produced, in the chain of normal mental and physical functions.

The continued gratification of a craving for artificial stimulation establishes in the habitué a vicious circle of disease, poverty, crime, and punishment, each one following the other in sequential order, and reacting upon each other until a break in the continuity of the circle is brought about through abstinence. Abstinence brings on a series of mental and physical disorders which require the restraining influence of a normal will-power, the lack of which compels the user to resort to drugs in order to obtain relief. Thus the habit becomes deep-rooted, the vicious circle continues to operate, the addict develops into a pathetic figure, and is finally reduced to a state of mental and physical deterioration.

The opportunity to study the addict, to discuss with him every angle of his addiction, to see him leave the hospital apparently cured, and to see him return repeatedly for readmission to the institution as a relapsed case, in extenuation offering a variety of plausible excuses, is afforded in the out-patient department of the Norfolk State Hospital where alcohol and drug inebriates apply for treatment. Close observation of these cases before and after treatment suggests that addicts become such because of an inherent or acquired mental weakness, and that in most cases it antedated their habitual indulgence in habit-forming drugs. In other words, it is the neuropath and psychopath who seeks in narcotic-drugs the missing link in his chain of normal functions, the restoration of which makes him feel "just right." With this contention in mind the main reason for our inability permanently to cure a fully developed drug addict becomes obvious. Even the widely advertised "quick cures" have failed to reduce the number of drug users and to make even a lasting impression upon the patient.



Those who have to treat addicts appreciate the futility of relying wholly on the innumerable pharmaceutical remedies so widely and variedly employed in combating the narcotic-drug habit. Successful treatment does not end with the discharge of the patient from the hospital. The real struggle begins at that stage, and becomes more intense and trying with each succeeding day.

Failure permanently to cure drug addiction is due to three powerful influences which assail the patient after treatment and discharge from the hospital. One, the distressing symptoms of abstinence, which gradually reappear and react upon the patient's power of self-control, destroying the stability of purpose that has been inculcated in the patient during his stay in the hospital; two, his return to the same unchanged social environment, which was probably the original cause of the victim's addiction; three, the patient's inferior mental stamina, which he may have acquired or inherited, but which renders him a prey for any form of stimulant. At any rate, the treated patient who has been pronounced "cured" almost invariably lacks the disposition or will to remain abstinent, and the slightest pretext or the most indirect suggestion is sufficient grounds for relapsing.

Hence it may be assumed that something more than purging, nauseating, depressing, motor-exciting drugs must be resorted to if success in the cure of narcotic-drug addiction is to be attained. To attain the desired end entirely different forces should be enlisted in the treatment,—forces employed by the psychologist, the alienist, the neurologist, and the internist.

Obviously, pharmaceutical remedies have but a single place in the treatment of drug-addicts. Using such remedies to alleviate or ameliorate the distressing symptoms of abstinence, and by combining with them the measures employed by the different specialists, one would offer to the patient a more reasonable and hopeful chance for cure than is afforded him by the hasty empirical methods used in institutions that advertise their "quick cures" in a rather alluring manner.

Successfully to cure drug addiction the addict should be treated in a hospital or institution specially constructed to receive such cases. To prevent escapes at the critical period of their treatment, and to provide for temporary close confinement which proper treatment necessitates, suitable and comfortable quarters with good ventilation and plenty of sunlight should be provided. Drug addicts are notoriously unreliable and should be closely watched; their quarters should be frequently searched for smuggled drugs. The seeming sincerity they display and their manifest inordinate desire for relief from their addiction would deeply impress the inexperienced, yet few addicts have been able to maintain for any length of time the same degree of interest in themselves which they so zealously manifested on previous occasion.

If only for these reasons the addict should be treated in an institution and not at the patient's home, and for no less a period than a year. Such prolonged and enforced residence in an institution may seem arbitrary and in effect unnecessary for the rare, earnest, and sincere addict, but experience with a large number of users dictates the need of employing such peremptory measures, successful treatment being attained only by adopting them. One can see the hopelessness of attempting to treat narcotic drug addiction in private practice, especially while the patient is free to enjoy any quantity of drug he may desire regardless of his physician's instructions. The honest physician should not undertake to treat such cases under such conditions. Whether the law should be amended prohibiting the physician in general practice from treating narcomaniacs at home and limiting him to the prescribing of narcotic drugs only in extreme emergency cases is suggested by the inevitable failure of home treatment and the opportunity it has opened up for the unscrupulous physician, to carry on a nefarious trade in narcotic-drugs. It seems that if that part of the Harrison Law were repealed and the law so amended as to limit the practicing physician to the prescribing or dispensing of narcotic-drugs only to meet emergency needs in his legitimate practice of medicine, the sordid and harmful practices of the unscrupulous physician could be obviated. Such a change in the law would indeed affect the honest practitioner, but the limitation would entail no hardship upon him if he would appreciate the futility of giving home treatment to drug addicts by the reduction method without the exercise of some form of restraint, such, for example, as could be obtained in an institution.

The aged user, the paralytic, and others too far gone for treatment, must have their daily supply. Who shall prescribe for them? The question, to be properly answered, must involve the proposition limiting the manufacture and sale of narcotic-drugs to government agencies, and the right to dispense narcotic-drugs to local boards of health. By so centralizing the source of supply in local boards of health and by compelling the druggist, the physician, the dentist, and the consumer to obtain their supply from this source, the irredeemable user could be taken care of and the unscrupulous physician and druggist would be eliminated, permitting the crusade against the evil to progress without hindrance from that source. At the same time, the redeemable addict could be induced to enter an institution for treatment, even for a protracted period, if his source of supply is completely cut off.

These suggestions apply only to the social users, of which there are approximately seventy percent. The criminal and delinquent type, of which there are approximately twenty percent, are subjects for the penologist and criminologist. This class of users is the most hopeless and



most dangerous element to deal with. They are intractable, cunning, designing, and wholly devoid of moral responsibility. It is their ambition to enlist new victims in the army of drug users, making it their business to keep them constantly supplied. In this class may be found the drug peddler, the white-slaver, the pick-pocket, the panhandler, and the all-round crook. Therefore, the successful eradication of the evil and the uprooting of the traffic would necessarily entail a disposition of this class of narcotic-drug users. With the elimination of this class the task of caring for the social user and for those who have contracted the habit through illness would be less difficult. The latter class constitute approximately ten percent of users, and indulge in drugs only to maintain a normal mental and physical tone.

The activity of the authorities in rounding up drug users and meting out to them the penalty imposed by law may be commended when it affects only the criminal class of users. But when the crusade is made general, affecting the redeemable social user the responsibility rests with the medical profession for having failed to recognize the condition as a definite disease, and to urge the employment of medico-social measures instead of penal measures in the rehabilitation of the unfortunate victims. The condition may still be remedied if the federal government and our legislatures would provide ample and suitable facilities for the care of the addict.

The penal institution has never cured the drug and alcohol inebriate. Unfortunately many addicts have been initiated to the use of habit-forming drugs in such institutions, taking it principally for the purpose of creating a euphoria to take the place of the depression which jail walls produce. On his discharge from the penal institution, the addict finds himself without moral fibre or mental strength, the need of which is obvious, if he is to be restored to his normal self.

Unfortunately the Harrison law provides that the addict should be deprived of his supply, but does not provide for his care. In other words, the law as it stands today drives the addict to employ the very means of procurement which it aims to contravene. Much of interest could be written on the methods employed by the addict to procure drugs. Where fair means fail, foul measures are unhesitatingly adopted. He who was meek and mild prior to addiction, is transformed under the stress and strain of enforced abstinence into the desperate habitué cunningly overcoming every obstacle which may be in the way of his obtaining sufficient funds with which to purchase his supply of drugs. In spite of our anti-narcotic laws, addicts apparently experience little difficulty in securing a plentiful supply. The price may be exorbitant, often productive, the product poor of quality and usually adulterated, yet these are not barriers to

procurement when the symptoms of abstinence manifest themselves in the patient. Many of the breaks and entries of police record have been committed in all probability by the cocaine habitué in his effort to obtain funds with which to procure drugs.

The police authorities of Massachusetts, appreciating the importance of segregating the different classes of drug users, have shown a disposition to give the habitué a chance, and the Norfolk State Hospital is being frequently called upon by the officials, to make analyses of doubtful cases and to advise what disposition should be made of them. In other states the addict's chances are not so good. The social user, the criminal, and he who contracted the habit through illness are thrown together and handled as a single class of offenders. As a result the social user comes in intimate contact with the vicious type, contracting, so to speak, his criminal tendencies and methods. This state of affairs should be done away with.

Contrary to the prevailing opinion of the medical profession and the laity, the majority of drug-users have themselves to blame for their addiction. These facts have been gleaned from addicts, approximately seventy percent of whom admitted on close questioning that their enslavement in drugs is due to their own manner of loose living and indiscriminate social relations with users. Thus stands the medical profession as a whole exonerated from the oft-repeated charge that its members are responsible for the widespread addiction among men and women. In this respect it may be said that as a general rule an addict's confession or admission is to be regarded with suspicion, and should be relied upon only when corroborated by others in whom confidence can be reposed. But when an addict places the responsibility of his folly upon himself, accepting whatever disposition his examiner will make of him, his statement may be regarded as true.

Unfortunately the medical profession does harbor unscrupulous physicians who have undoubtedly done much to further the spread of the evil. These men are responsible for the general accusation against the profession in this as in other things. Jail sentence is the only remedy for them.

Even the honest but untaught and inexperienced physician has undoubtedly unconsciously induced the habit in patients ill with a painful malady by prolonged administration of habit-forming drugs. He should be educated.

In the interest of the seventy percent of social users of narcotic-drugs, which constitute the desirable class for institutional treatment, our legislatures should be urged to provide suitable and adequate facilities for their proper care along modern and rational lines, that they may be restored again to useful citizenship and to society. These facilities should be provided, as Dr. F. H. Carlisle suggests, on an island far away from outside interference.



## Clinical Department.

### ACUTE PRIMARY "IDIOPATHIC" PHLEGMONOUS GASTRITIS. REPORT OF A CASE WITH BACTERIOLOGICAL FINDINGS.\*

BY EMANUEL B. FINK, S.B., CHICAGO.

By this term is generally understood a purulent inflammation of the stomach wall, which most often localizes in the submucosa, and there leads to more or less extensive pus formation but which may also affect the mucosa, muscularis, submucosa and serosa.

On the basis of etiology, phlegmonous gastritis is divided into two classes.

1. The primary or idiopathic forms, in which a direct cause is not demonstrable.

2. The secondary forms. The latter are again divided into three sub-groups.

a. Direct extension phlegmons, *i.e.*, those following oesophagitis.

b. Local secondary phlegmons which follow ulcer, carcinoma, or an operation.

c. Metastatic secondary phlegmons, in which infection of the stomach follows infection of some other part of the body.

On the basis of pathologic anatomy two forms are distinguished: the diffuse phlegmonous gastritis, in which the pus infiltration spreads diffusely over a considerable area, and the circumscribed form or gastric abscess. Strictly speaking, only the former should be included among the cases of phlegmonous gastritis.

The primary or idiopathic phlegmonous gastritis (Hosch<sup>1</sup>) is the most frequently encountered, and our case also belongs to this class. It is not our purpose to give an extensive review of the literature, as several excellent reviews are on record, among the more recent of which is that of Bossart<sup>2</sup> in 1912, which consists of a comparative study of all cases which the author was able to find with a complete bibliography. Among the earlier papers may be mentioned those of Schnarrwyler,<sup>3</sup> Robertson,<sup>4</sup> Adams,<sup>5</sup> Koenic,<sup>6</sup> Jensen,<sup>7</sup> in 1911, recorded the detailed histories of ten Danish cases, and found 121 on record elsewhere. In the literature before 1911, Bossart was able to collect 110 cases of circumscribed and diffuse phlegmonous inflammations of the stomach wall. Emge,<sup>8</sup> in 1914, thought that only one-half the cases reported, or about 50, were true primary, or idiopathic phlegmonous gastritis. It is difficult to make a correct estimate without running down each case recorded, but most authors are agreed that the idiopathic variety is the one most commonly observed.

The history of this case was kindly furnished me by Dr. Paul Oliver of the Surgical Staff, of the Cook County Hospital.

The patient was a laborer, 58 years old, of Swedish nationality. He entered the hospital Dec. 24, 1915, because of a large inguinal hernia on the right side, which had slowly grown in size during a period of eight years. It had never been painful or irreducible, and he wished to have it attended to because of some discomfort and interference with heavy work. He also stated that a swelling of the left forearm had developed and persisted, following a fall upon the hand one week previously. He had noted some edema of the ankles during the past year. About a year ago the patient had been in the hospital on account of broken compensation. He further stated that at one time he had been a heavy drinker, but had not taken liquor in recent years. He had had some nocturnal frequency of urination. Otherwise the history was negative.

Upon physical examination, the man appeared to be obese, with ruddy complexion and a moderate acne rosacea. The mouth was in bad condition; teeth decayed, pyorrhea alveolaris, tongue swollen and covered with a brown coat. The tonsils showed some enlargement. Except for a few mucous râles the lungs were negative. The heart dulness was increased. There was a systolic murmur transmitted to the axilla and an accentuated second pulmonic. The abdomen was negative, except for the liver, which was palpable two fingers' breadth below the costal margin. In the inguinal region there was a large hernia which passed down the inguinal canal and was easily reducible. A smaller hernia was present on the left side. There was a soft edema of both ankles. There was swelling and discoloration of the left forearm and hand which the Roentgen plate showed to be due to an incomplete fracture of the radius. The urine showed a specific gravity of 1.012, a trace of albumin and granular and hyaline casts. From these findings a clinical diagnosis of right complete indirect, inguinal hernia, left incomplete hernia, decompensated heart lesion, chronic nephritis and recent left Colles fracture was made.

After a period of appropriate medical treatment the patient improved, so that on Jan. 4, 1916, a repair of the right hernia under local anesthesia was made by Dr. Ryan. The post-operative course was normal in every way until the night of January 15, about ten days after the operation, when he complained of a chill and his temperature rose to 101.6 with a pulse of 96. He then complained of pains in the abdomen, especially in the epigastrium. During the next three days the temperature ranged between 99.8 and 102, with the pulse becoming more rapid and the pains more severe. During the night of January 17, the patient moaned all night because of the severe pain. He did not vomit at any time.

Dr. Oliver first saw the case on the 18th of January and found the patient with flushed face and apparently in distress, with respirations rapid and shallow, temperature 101.2, pulse 130, irregular and weak. The abdomen was rigid and somewhat tender in the epigastrium. The patient pointed to the epigastrium as the source of the trouble. There seemed to be slight shifting dulness in the flanks. A probable diagnosis of general peritonitis was made, the source of which was difficult to determine, a perforated gastric ulcer being thought most likely. Immediate operation was decided upon, and under ether anesthesia, the abdomen was opened through a right rectus incision. As soon as the peritoneal cavity was entered a few ounces of a dark sero-pus escaped. Exploration of the lower

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abdomen was negative, except for a hernia on the left which contained an appendix epiploicum. There was only slight injection of the peritoneum in this region, but the serosa of the bowel of the upper abdomen showed marked injection and some fibrinous exudate. The omentum was found firmly wrapped about the stomach, just as it is often found about an acute appendix. Upon its separation, a large amount of pus escaped and revealed the stomach a uniform angry red, having the appearance of a very acutely inflamed appendix. The wall was stiff, thick, indurated and edematous and the process seemed to involve the entire organ, stopping abruptly at the pyloric sphincter. The duodenum beyond could be felt thin walled, and apparently normal. The pylorus felt like a solid mass. Careful search was made for a perforation without success. Nothing further was attempted, the patient being put to bed with tubular drainage in the suprapubic stab wound and upper abdomen. The patient did not react after operation and died in about eight hours.

The post-mortem examination was made on the afternoon of the same day, January 19, 1916, by Dr. H. Gideon Wells, to whom I am indebted for the abstract from his autopsy records and for permission to work up the case.

The following is an abstract of the autopsy notes on this case:

*External Appearance.* The body is that of an obese man. There is a slight yellow coloration of the skin. The superficial lymph glands are not palpable, except those of the right groin. There is some edema of the legs. The scrotum is reddened, and in the right side is an indurated mass about 5 cm. in diameter, continuous with the testicle. There is a little hernial bulging on the left side. In the anterior abdominal wall are two openings, one above the pubic crest and extending to almost the costal margin above the outer border of the right rectus. There is another drain in the lower portion of the latter.

On palpation, there is an indurated mass along the course of the right inguinal canal. Above the umbilicus is a circular nodule in the subcutaneous fat, 7 mm. in diameter. There is a recently healed surgical wound parallel to the right Poupart's ligament.

*Abdominal Cavity.* There is a considerable amount of subcutaneous fat, about 5 cm. in thickness. The upper drainage tube passes between the liver and stomach, deeply into and over the lesser curvature to reach the retroperitoneal tissue. The peritoneal surface is very much reddened. The lower tubular drain runs into the cul-de-sac of Douglas in which there is a small amount (30-50 c.c.) of purulent fluid. A cigarette drain runs between the intestines. The peritoneal coat is injected, but for the most part is shiny. In the intestines of the peritoneum are pockets of purulent fluid but no large accumulations of fluid, and no fibrin. The left inguinal ring is open and admits two finger tips up to the external ring, after which only one finger tip is admitted. The right inguinal ring is closed. The mass consists here of fibrofatty tissues in which are small hemorrhages. There is no evidence of infection or suppuration here. The peritoneal surface in this region is puckered, but no infection is present.

The mesenteric lymph glands are not enlarged, but there are small pigmented spots and a small calcified fibrous strand in the peritoneum. The ap-

pendix is free but atrophied. Such pigmented areas are also found 20 cm. above the ileocecal valve. There is one particular area, one mm. in diameter, in which the peritoneum is necrotic and a necrotic tissue protrudes, but there is no perforation. There are no perforations in the small intestines. In the lesser peritoneal cavity there is a little purulent fluid but no perforations. The lesser peritoneum is free from adhesions. Some fibrous adhesions are present about the spleen; also a few about the sigmoid. The diaphragm is at the fourth interspace on the right side, and at the upper border of the sixth rib on the left.

*Gastro-intestinal Tract.* In the intestines there is a small pigmented area in the ileum, but no ulcers. The stomach shows a markedly hyperemic but smooth serosa, and on palpation shows diffuse thickening of the wall but no great induration. The thickening is most marked above the pylorus. On the lesser curvature is a point of irregular perforation limited to the serosa where the drainage tube was located. There are no adhesions about this perforation. Upon opening the stomach, the mucosa is seen to be diffusely hyperemic with hemorrhages beneath the mucosa. Folds of mucosa are missing. There is a purulent infiltration of all parts of the wall, and when cut, creamy yellow pus oozes out. The infiltration extends from the cardiac orifice to the pyloric valve, where it stops abruptly. The mucous membrane is everywhere intact. The purulent material forms a layer apparently in the submucosa, one to four mm. in thickness, the pus oozing out slowly from the cut surface everywhere. The stomach is heavy and boggy, weighing 440 grams, emptied. No ulceration or tumor masses are visible. The mucous membrane is swollen and edematous. There is some hemorrhage in the mesogastrium, but no adhesion about the stomach.

Other autopsy findings are indicated by the following:

*Anatomical Diagnosis.* Acute diffuse phlegmonous gastritis. Acute suppurative peritonitis. Two recent laparotomy wounds with drainage. Recent healed herniotomy incision. Remains of hernial sac in right inguinal canal with hematoma. Chronic interstitial nephritis (red granular kidney). Thrombotic occlusion of anterior coronary artery with anemic necrosis in left ventricle. Hypostatic congestion and edema with broncho-pneumonia in right lower lobe. Slight atrophic cirrhosis and passive congestion of the liver. Parenchymatous degeneration of the liver and spleen. Fibrous peritonitis. Senile arteriosclerosis with atheroma. Edema of lower extremities. Obliteration of left tunica vaginalis testis. Necrotic masses in serosa of ileum. Lipomatous nodule in anterior abdominal wall. Diffuse fibrous myocarditis.

*Histological Examination.* The surface of the mucosa shows only post-mortem changes. Just beneath the surface there are small areas of hemorrhage. In the deeper portions of the mucosa, bordering on the muscularis, there is a diffuse infiltration of polymorphonuclear leucocytes. Scattered throughout this area are small masses of bacteria. The muscle bundles in the muscularis mucosa are widely separated and the spaces between are filled with polymorphonuclear leucocytes. In the upper layer of the submucosa there are two large circumscribed areas consisting of polymorphonuclear leucocytes and small masses of necrotic connective tissue and elastic fibers. Between these two areas of



suppuration the submucosa shows only a diffuse infiltration and some fibrin. The deeper layers present the same picture. The serosa is normal. Apparently the pus infiltration of the submucosa occurred in two bands separated by a wall which had not yet been replaced by pus, and only the upper layers of the submucosa were involved in the process. The diagnosis was acute interstitial phlegmonous gastritis, with marked suppuration of the submucosa and muscular coat, but no ulceration of the mucosa.

**Bacteriological Findings.** Microscopical examination of pus smears taken from the wall of the stomach and stained with methylene blue showed pus cells filled with chains of diplococci, four to six pairs to the chain. Scattered through the field were single diplococci. Careful search of several smears failed to reveal any other organism. Other smears stained with Giemsa's stain showed that the pus consisted almost entirely of polymorphonuclear neutrophils containing this same short-chain streptococcus, for the most part intracellularly.

Cultures were made on January 19, 1916, the day of the autopsy. After searing the surface of the stomach wall, pus was aspirated with a sterile Pasteur pipette. The contents were then smeared over the surfaces of agar and blood serum tubes, and also inoculated into broth. In addition, some of the material was plated on blood agar. Both aerobic and anaerobic cultures were made; the anaerobic cultures being placed in a Noy jar, and the pyrogallie acid method used to obtain anaerobic conditions.

After twenty-four hours the broth showed a uniform turbidity. On shaking, a faint cloud could be seen whirling through the medium. On slant agar there were discrete, dewdrop, moist colonies, each about 0.5 mm. in diameter. Growth was very poor. On Loeffler's blood serum, there was a pale, yellowish-brown slimy growth covering the surface. The surface of the medium had not been digested. Smears from these cultures showed the same organism that had been observed in the pus smears, and here, too, it occurred in short chains and diplococci. It retained the stain by Gram's method of staining. Subcultures made on all the ordinary laboratory media gave all the cultural characteristics of the streptococcus group. On blood agar (human blood), there appeared small pin-point colonies, with a clear zone of hemolysis about one mm. wide around them. The cultural characteristics were the same, both aerobically and anaerobically.

The fermentative reactions of this organism were studied, both aerobically and anaerobically. For this purpose three loopfuls of a twenty-four hour old broth culture were inoculated into tubes containing ten c.c. of sugar-free broth, and one per cent. of the sugar or carbohydrate to be tested. In addition, each tube contained enough of a one per cent. litmus solution to give it a distinct blue color, and a small inverted fermentation vial to show gas formation. The substances tested were dextrose, lactose, saccharose, raffinose, dulcitol, arabinose, salicin, sorbitol and xylose.

The aerobic culture fermented dextrose, lactose and salicin with enough acid formation to impart a distinct red color to the litmus, but without gas formation. The cultures containing dulcitol and sorbitol were very faintly acid, and showed no gas. Saccharose, raffinose, arabinose and xylose were unaffected.

Anaerobically the organism fermented all the sub-

stances tested with the formation of acid. In the cases of dextrose, lactose, saccharose, dulcitol, sorbitol and xylose enough acid was formed to completely discharge the color of the litmus. Gas was formed in all the tubes, varying in amount from a single bubble in those containing saccharose and salicin, to a tube-full in those containing dextrose, raffinose, dulcitol and sorbitol.

Experiments were also carried out in an attempt to reproduce this condition in animals. A rabbit was injected intravenously with a twenty-four hour broth culture and died the next day showing all the findings of an acute toxemia except an enlarged spleen. The organism was recovered in pure culture from the heart's blood. Several animals were thus treated with the same result.

Two guinea-pigs were injected intra-cardially with one c.c. each of a twenty-four hour culture and died the next day of acute toxemia. In none of the rabbits or guinea-pigs did the stomach show any lesions whatever.

An aseptic operation was performed upon a dog in which a twenty-four hour growth on agar suspended in sterile salt solution, was injected into the wall of the stomach, through a laparotomy wound. The animal recovered from the operation and the wound healed, but no symptoms of illness developed after two weeks. The same dog was then given an intravenous injection of another twenty-four hour growth, without showing any ill effects after forty-eight hours. A subsequent intra-cardiac injection of the same organism caused death within twenty-four hours. A streptococcus was isolated from the heart's blood, but the stomach was normal, with the exception of a small hemorrhagic area in the serosa, representing the site of injection.

A similar operation was performed on another dog, who also recovered, and after two weeks seemed to be perfectly normal. Because of the statements in the literature that alcohol seems to be a predisposing factor, we introduced 50 c.c. of 50 per cent. alcohol into the stomach of this dog on several successive days, by means of a stomach tube. A twenty-four hour broth culture of the same organism was then poured over the meat which was eaten by the dog at a single meal. The animal became ill, with spells of vomiting for two days, but later recovered and seemed to be as well as ever. One month after the operation this dog was given an intravenous injection of a twenty-four hour culture, and was killed the next day. A careful examination of the stomach at autopsy showed only a few punctate hemorrhages beneath the mucosa; otherwise it was normal.

In most of the cases thus far reported streptococci have been found commonly in pure culture, rarely associated with other organisms such as the staphylococci, or the bacillus coli communis. Muenter<sup>9</sup> reports a case in which the pneumococcus was apparently the causal organism.

As early as 1893 Pilliet<sup>10</sup> states that according to Straus and Schillon the infiltration of the stomach wall, and especially the connective tissue of the submucosa, is caused by death or injury to the mucous membrane, through which streptococci may gain access to the depths. He further states that in producing the disease, experimentally, mineral acids or organic acids are of no avail, since they lead to the formation of a sear or only to a hemorrhagic infiltration of



the wall. By introducing 5 gm. of zinc chloride (1-10), over a period of three days, into a rabbit, he succeeded in causing the formation of a scar and edematous swelling of the mucosa and submucosa, so that the thickness of infiltrate was 0.1 to 1 cm. No bacteria were demonstrable in sections. His conclusion is that acute fibrinous infiltration of the stomach wall is brought about only with the caustic solutions, such as zinc chloride and not with coagulating substances. This, according to him, is the first step in the production of phlegmonous gastritis. Our own experiments along these lines were negative, in the case of a dog. Kleiberger's patient<sup>11</sup> received 3.5 gms. of potassium iodide in three days, and this author believes that the iodide entered the stomach through defects in the mucosa and set up an inflammatory process which later led to phlegmonous gastritis. Bossart (loc. cit.) believes that idiopathic phlegmonous gastritis has its points of origin in the flat epithelium at the cardiac end of the oesophagus, and that this region is especially favorable for the localization of streptococci.

More recently, Cheinisse<sup>12</sup> has directed attention to the unappreciated occurrence of acute gastritis in infectious diseases. He has encountered several cases of erysipelas and mumps in which the gastric symptoms dominated the clinical picture and could be explained only by assuming a localization of the specific infectious process, the erysipelas or the mumps, in the stomach. Cheinisse had a case of phlegmonous gastritis in 1909 which developed in the course of an apparently mild erysipelas. Baird<sup>13</sup> also reports a case which ended fatally shortly after the development of facial erysipelas. Vasilevsky<sup>14</sup> also believes that phlegmonous gastritis is a secondary complication in the course of some general infection such as erysipelas. In his case the erysipelas spread to the mucosa of the mouth, pharynx, oesophagus and stomach.

We are inclined to believe that local injuries are not an important factor in the causation of this condition, but rather that it represents the localization of an organism, analogous to subcutaneous phlegmon, and to be explained on the basis of the anatomy of the organ, and possibly thrombosis of the vessels of the submucosa. As bearing upon the rôle of focal infections in the production of phlegmonous gastritis, the case of Schwarz<sup>15</sup> is of interest. In his case the infection apparently spread from the tonsils, which were swollen and ulcerated. In the latter, as well as in the fauces and in the peritoneal exudate, numerous streptococci were found. Schwarz believes that a portion of the cases, at least those with unknown sources of infection, might be explained as due to infection from the tonsils. It should also be remembered that this condition is practically never diagnosed except at autopsy. It would be well to bear in mind that this condition is a possible complication in acute infectious diseases and to suspect it whenever acute stomach symptoms develop, especially when ac-

companied by sudden pain in the epigastrium, and severe vomiting of material containing pus.

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- <sup>7</sup>Hospitaltidende, Copenhagen, 1911, 54. Abstracted in Jour. Am. Med. Ass'n, 1911, 57, 620.
- <sup>8</sup>Transac. Chi. Path. Soc., 1914, 9, 82.
- <sup>9</sup>Deutsch. med. Wchschr., 1908, 34, 1347.
- <sup>10</sup>Le progrès médical, 1893, No. 50.
- <sup>11</sup>March. med. Wchschr., 1903, 51, 1338.
- <sup>12</sup>Scimaine médicale, Paris, 1911, 409. Abstracted in Jour. Am. Med. Ass'n, 1911, 57, 1168.
- <sup>13</sup>Am. Jour. Med. Sc., 1911, 142, 648.
- <sup>14</sup>Russkij Vrach, Petrograd, 1915, 14, No. 16. Abstracted in Jour. Am. Med. Ass'n, 1915, 65, 1068.
- <sup>15</sup>Wien. med. Wchschr., 1905, 55, 904. Cited by Bossart.

## Medical Progress.

### PROGRESS IN OPHTHALMOLOGY.

By EDMUND W. CLAP, M.D., BOSTON.

#### ETIOLOGY OF GLAUCOMA.

R. H. ELLIOT has written on the ætiology of glaucoma, discussing various theories. We quote him as follows. We cannot base our ætiology on the pathology, but on clinical observations tempered by a study of the changes produced both in the eye and in the organism by those conditions of life which may be causative of the disease. Glaucoma being a label for a large group of conditions, the distinctive feature of which is increased tension, must have a widely different ætiology in different cases. Once increased tension is established, every sign and symptom finds a ready explanation.

The different factors cited as causes of glaucoma may be brought under one or the other of two headings: (1) Those which influence the balance of secretion and excretion of the intra-ocular fluid. (2) Those which directly or indirectly determine a change in the vascular conditions prevailing within the eye. Taking up the more interesting observations, we have changes in the vortex veins. Ligature of these veins in animals produces increase in tension, but thickening and obstruction of these veins in glaucoma is rare. Disease of the vessels, brought forward as a cause, may usually be put down as a result, of the increased tension.

Schnabel in 1892 thought that cupping of the disc was due to an acute atrophy of the nerve itself. The lamina cribrosa was not pushed back by pressure, but pulled back by shrinking of the nerve. Small spaces were formed, and at length a large cup—a cavernous atrophy. But this cavernous atrophy has been met with in eyes that never have had increased tension, and no signs of it are found in most glaucomatous



globes. Disappearance of the cupping has been seen after an operation permanently reducing the tension. T. Henderson believes that a structural change in the pectinate ligament is responsible for an obstruction to the ready access of the aqueous fluid to Schlemm's canal.

Sclerosis of the pectinate ligament may offer an obstacle to free escape of aqueous, but it is universal as age comes on, while glaucoma is not very common. Intraocular pressure does not tend to rise as age advances. This theory does not account for shallowing of the anterior chamber nor closure of the filtration angle. The production of edema by action of acids or alkalis on the colloidal tissues of the body led Fischer to consider glaucoma an edema of the eyeball, in which the amount of water held by the hydropyllic colloids is increased by an abnormal amount of acid. But we do not find the swelling of the ocular tunic which the theory demands, nor the strength of acid sufficient to produce the effect.

Closure of filtration angle is caused by the base of the iris being pressed against the periphery of the cornea. Next the surfaces adhere from plastic exudate and the iris is firmly compressed so as to occlude the spaces which normally allow the free passage of fluid through the iris stroma. Finally atrophy of the iris comes on, and a drawing back of the iris when the ciliary processes retract. In congestive glaucoma, turgescence of the ciliary processes displaces their apices forwards and inwards, and carries the iris forward, and tends to jam its base against the cornea. In simple glaucoma, forward displacement of the iris is a result of the enlargement and advance of the lens. Closure of the filtration angle occurs at some stage in nearly all, if not in all, cases of primary glaucoma. Shallowing of the anterior chamber is associated with closure of the angle, and in itself favors a wider adhesion of the iris base with the cornea. When there is increased tension without much shallowing of the anterior chamber there is an altered aqueous which renders filtration slow and difficult. Priestley Smith sums up his views as follows: A shallow anterior chamber is a physiological condition of the time of life in which primary glaucoma arises, and is due partly to growth of the lens and partly to advancement of the lens by the prominent ciliary processes.

In an acute attack the turgid processes block up the circumferential space, and the vitreous is imprisoned behind the lens and drives it forward, and perhaps the swollen processes themselves drive forward the lens. Smallness of the eye is frequent in glaucoma, and the eyeball is fully grown somewhat before the rest of the body, while the lens grows larger as life advances.

Probably these changes are operative in the causation of all attacks of glaucoma. In the congestive attacks they are overshadowed by

evidences of the vascular storm. The incidence of glaucoma increases with advancing years, and may be attributed to: (1) enlargement of lens, (2) slackening of zonule, (3) thickening of pectinate ligament. Degenerative changes: (1) increase of volume of fluid secreted by the eye, (2) alteration in the nature of the secretion of ciliary body, (3) autogenetic intoxication. Risley says glaucoma rarely occurs in individuals in good general health, and LaGrange says such an eye is a sick eye in a sick body. Arteriosclerosis is probably not a factor; as far as high blood pressure is concerned, loss of vasomotor control in the body generally, and in the eye specially, plays a part in the causation of glaucoma. Females suffer from glaucoma more than males, in the proportion of about 57% to 43%. Heredity, too, plays a part. Smallness of eye, a want of normal development of structures about the angle of the anterior chamber, instability of nervous and vascular systems, conditions of environment, may all be considered here. Perhaps there is some connection between hyperopia and glaucoma, though it can occur in myopes. Mydriasis from drugs, exclusion of light, influence of violent emotions, and the effects of depressing diseases may give rise to increase of tension. Finally, febrile diseases and injuries must be included in the etiology of glaucoma.

#### INTRASPINAL TESTS AND MEDICATION.

Examination of the spinal fluid has attained great value in the diagnosis and the spinal route has aided in treatment. Ayer reports 160 cases of interest to the ophthalmologist. He finds this method most important, not in the plain cases of tabes or atrophy, but in early cases of slightly irregular or unequal pupils, perhaps with sluggish reaction, in early diplopia, suspected atrophy, etc. Of 40 cases of external ocular palsy, in eleven the tests were of prime importance, the palsy being the only sign. In 44 cases of primary optic atrophy there were found only 12 normal spinal fluids, and four of these tests were after antisyphilitic treatment. The outlook for the atrophies, if taken far advanced, is nearly hopeless; in early cases there is some chance. Argyll-Robertson pupils mean syphilis of the nervous system, but the spinal tests may show whether the disease is active, or stationary and degenerative only, or dead and quiescent. When irregular pupils are found, the importance of syphilis as an active factor can be determined.

Along this line is the work of Schoenberg, who has done experimental work on intracranial treatment of syphilitic optic nerve affections. His experiments show that serum introduced into the spinal canal does not reach the optic nerves. There is no doubt that spirochetes and not toxins alone, are the cause of syphilitic primary optic atrophy. The outer and the inner (ventricular) surface of brain, the outer sur-



face of the optic nerves, the perivascular spaces penetrating into the brain tissue and into the septa between the optic nerve bundles, form a system of spaces and channels filled with cerebrospinal fluid, and into this we must introduce our medication if we intend to reach the nervous tissue itself.

Schoenberg tried intravital staining in animals, and found that intraspinal or intravenous injection of the stain did not reach the optic nerves. The chorioid plexuses retain the stain in intravenous injections. Cranial intraventricular injections, without exception, gave the best results. The accepted view is that tabetic and parietic optic atrophy consists of a primary degeneration starting in the retina, while in cerebrospinal syphilis the degeneration is descending, often following an inflammatory process in or around the chiasm or optic nerve. Syphilitic and metasyphilitic changes then occur under two types—one mainly in the vascular interstitial tissue, the other mainly in the parenchymatous tissue (ganglion cells and fibers). The first constitutes cerebrospinal syphilis, the second tabes and general paralysis. More recent studies seem to throw doubt on the retinal origin of primary optic atrophy and that everywhere an exudative process precedes such a picture, but the spirochetes must play the important part. If these researches are confirmed, the importance of direct treatment is evident and must be intraocular so as to get at the microorganisms while they are in the nerve sheaths and before they migrate into the nerve bundles and between the fibers, and degeneration has set in.

#### TRAUMATIC HYPOTONY.

Treacher Collins treats of that form of hypotony occurring after contusions of the eyeball, in which no perforation of its coats has taken place. The duration of the diminished tension varies from a few days to several weeks, and in some cases it appears to be permanent. The author gives several cases, and discusses the probable causes at length under these headings: (1) Diminished secretion—(a) from nerve inhibition, (b) from vascular disturbance, (c) from epithelial damage. (2) Increased excretion—(a) through normal channels, (b) through new given channels.

We give his conclusions: That hypotony may be due to different causes, and more than one cause may be present in the same case. The cases of short duration are due to increased rate of excretion through expanded normal channels or possibly to some arrest of secretion from paresis of the vasoconstrictor nerves.

When of long duration, it may be due to the formation of new channels of exit from the anterior chamber, either from an internal scleral rupture or rupture of the pectinate ligament, the cutting off of the blood supply to the ciliary body from rupture of the anterior ciliary ar-

teries, or possibly detachment of the pars ciliaris retinae. If accompanied by extensive hemorrhage into the anterior chamber, either the canal of Schlemm has been opened up by internal scleral rupture, or the anterior ciliary arteries have been torn across from cyclodialysis. If a portion of the iris has disappeared, as though an iridectomy had been done, there has been cyclodialysis with rupture of the anterior ciliary arteries. If a translucent area appears after a time just outside the sclero-corneal margin, then there has been an incomplete internal rupture. If the anterior chamber becomes markedly deepened in the whole or in part of its circumference, there has probably been a rupture of the pectinate ligament and of the ciliary muscle, prolonging the angle of the anterior chamber outward.

If the lens is dislocated laterally and the retina detached, the vitreous humor has probably come forward into the circumferential space, and may have dragged the pars ciliaris retinae away from the pigment epithelium.

#### ANOMALIES OF ACCOMMODATION.

Duane considers anomalies of accommodation from the clinical point of view. He has observed the following: (1) The accommodation may be persistently below normal limit. (2) Accommodation normal in amount, but sustained only with effort and soon exhausted. (3) Sluggishness in changing from one accommodative state to another (inertia of accommodation). (4) The accommodation in the two eyes is not the same. (5) The accommodation lies persistently above the usual normal limit. Insufficiency of accommodation may be intermittent or constant, and transient or persistent. This condition occurs in at least 5% of our patients. It is not common before 15 or after 45. It may be due to undue rigidity of the lens or to weakness of the ciliary muscle. In the type due to premature sclerosis of the lens the accommodation drops in the normal fashion from year to year, but in any one year is always below the normal standard. The second type is due to pathologic conditions; it varies, often in a haphazard manner, even rising to normal at times. Mixed types probably occur.

The causes of the simple premature presbyopia are unknown, but the ciliary weakness has been found due to: (1) Toxic conditions from infectious disorders. (2) Nasal obstruction. (3) Neurasthenia and anemia from overwork, impaired nutrition, etc. (4) Vascular hypertension. Insufficiency of considerable amount may be called paresis, and one that is more complete a paralysis. Paralysis of accommodation is due usually either to poisons (cycloplegics) or to syphilis. The syphilitic (tabes, general paresis) paralysees are intractable and of bad prognosis and not yielding to treatment, though they may get well spontaneously. They are often unilateral, and usually, but not



always, associated with paralysis of the sphincter iridis. Non-syphilitic disease of the central nervous system has caused it, as also have traumatism, disorders of metabolism, eye strain and diphtheria.

In toxic and traumatic paralyses the lesion is usually peripheral. In syphilitic paralyses it is either peripheral, basal or nuclear. Unequal accommodation may be due either to lens or ciliary muscle. In syphilis, traumatism and poisons the sphincter iridis is affected too. Most of the other cases seem to be due to unequal rigidity of the lenses.

#### THE BLIND SPOT.

Gradle reviews what we know of the blind spot, beginning with Marriotte in 1668. The fibers from the retina around the optic disc lie in the periphery of the optic nerve, directly beneath the pia throughout its entire course.

In speaking of sinus disease, he says, the infection, the edema or other disturbing factor passes from the sinus periosteum through the diploic veins and lymph channels to the orbital periosteum, thence by continuity to the intracanalicular portion of the dura of the optic nerve, or possibly through the periosteal veins or dural veins, directly to the vein of Vossius.

If the dura alone is involved, a pressure is made upon the periphery of the nerve within the canal, and an enlargement of the blind spot will result. If the process extends farther and involves the central vein of Vossius, the neighboring nerve bundles will suffer. These are the papillo-macular bundles, and a central scotoma follows. In Gradle's view, when the optic nerve is involved in sinus disease the trouble is transmitted by the soft parts alone. The enlargement of the blind spot in an outward direction in malignant myopia is attributed to peri-papillary atrophy, of which the chorioidal signs can be seen, but the retina measured only by the perimeter. Gradle does not believe that medullated nerve fibers cause an enlarged blind spot. He mentions the relation of the blind spot to the field in glaucoma, and the fusiform enlargement above and below the vertical meridian in sympathetic ophthalmia. In eclipse blindness there has been found enlargement of the blind spot. Gradle says that tobacco or alcohol amblyopia is due to a toxemia of the bundles within the optic nerve itself, and that the relative central scotoma may or may not include the blind spot. The author gives his method of measuring the blind spot. He used a white screen with dark steel balls actuated by a magnet from behind.

#### DESICCATION OF NEW GROWTHS.

Clark has had success in using the desiccation method on epitheliomas about the eye, sarcomas, angiomas, moles, warts, xanthelasma, upus, pterygium, granular conjunctivitis and

corneal ulcers. Heat is employed just sufficient to desiccate the growth without carbonizing it. The heat is best generated by a high frequency electric current subject to accurate regulation. The author used a high speed static machine. Local anesthesia for the conjunctiva by a 4% cocaine solution; for the lids, infiltration with novocaine and epinephrin, is employed. A very fine needle in an insulated holder is just brushed over the tissue, but not usually thrust into it.

The depth of the desiccation depends on the time of contact and the driving power of the current. A minute growth or pigmentation, even on the cornea, may be desiccated without danger of going too deep, or part or the whole of an eyelid may be removed with precision. Cartilage and bone may be devitalized. After a growth has been converted into a dry mass, it is usually curetted or excised immediately, but sometimes it may be allowed to slough. There should be no bleeding. No sutures are necessary, and the cicatrix does not show a tendency to contract. Infection has not been observed, and the blood and lymph channels are sealed. The author compares this method with excision, radium and x-ray treatment, cautery, liquid air, etc., and after detailing many cases, gives the following conclusions:

Desiccation is good treatment for localized basal cell epitheliomas of lids and canthi, both from a curative and cosmetic standpoint. In advanced epitheliomas of these regions it may be a useful palliative treatment when operation fails.

The results in round-celled and melano-sarcoma have been good, but time enough has not elapsed to determine ultimate results. Success is assured in benign growths of the lids. Symblepharon usually does not follow desiccation.

#### GLASS WORKERS' CATARACT.

Robinson, who in 1903 and in 1907, wrote on cataract in glass workers, has a new report on this subject. In a majority of his patients, the opacity began in a characteristic way in the cortex of the lens at the posterior pole. It is just under the posterior capsule, often irregularly disc-shaped and by oblique illumination brass colored. As the haziness spreads it clings to the posterior capsule so as to be saucer-shaped and often presenting an irregular network. From the posterior pole the opacity gradually spreads and the ripe cataract has a pearly hue. In the later stages it is not to be distinguished from an ordinary senile cataract. The author believes this type of cataract not to be a secondary one, as operation usually gives good vision and shows no fundus disease. The original report gives a lengthy description of the exact nature and conditions of the work done by different workmen. The author could not get the opportunity to examine all the men in his district so that his figures are probably too low. In these factories about 400 men are em-



ployed, and he found 40 with cataracts. In the cases where the onset could be ascertained, two-thirds began before the fiftieth year. The average time from beginning failure of sight up to disablement was about three years. Both eyes are almost always affected. In another series of cases, where there is much incompleteness in the data, of men over fifty and disabled from various causes, of 114 men, 37 had cataract; and there is no record of those under 50. Dr. Legg found in 513 furnace workers 22 cases of cataract, and not more than two of these could have been included in the former statistics. In a large factory employing 4000 hands, one-half are exposed to glare of furnaces and one-half not. Each half contributes about equally to the cases of ordinary sickness, treated by a Sick Club, but all the cases of cataract found have come from the half who are exposed to the furnace glare. The frequency of cataract varies in proportion to: (1) the heat, (2) the degree of exposure, (3) the length of time each day and the number of years the men are exposed. The author discusses the physics of light at length and concludes that ultra violet rays do not cause the damage nor do the luminous rays, but the heat rays are to blame. Of course, protective measures, especially glasses, have been advised, but not much used as yet. Sir William Crookes has had glass made that will cut out nearly all the infra red rays (not our present "Crookes' glass"), but it is not yet practical, as it does not transmit enough luminous rays.

### Book Reviews.

*Refraction of the Human Eye and Methods of Estimating the Refraction.* By JAMES THORINGTON, A. M., M. D. Emeritus Professor of Diseases of the Eye in the Philadelphia Polyclinic and College for Graduates in Medicine. Philadelphia: P. Blakiston's Son and Company.

The author states that this work is an amalgamation of his previous works "Refraction and How to Refract," "Prisms" and "Retinoscopy." These have been combined and modified to produce a book for beginners in ophthalmology. The book certainly covers the ground in a comprehensive and entertaining manner. With the exception of a few tests of historical interest only, Dr. Thorington gives all the methods of detecting and correcting errors of refraction and muscular balance and all the theoretical knowledge necessary to a good understanding of these subjects.

The book is eminently practical and we recommend it to all students of refraction. There is a good chapter on the fitting of spectacles, etc. There are 344 illustrations—twenty-seven colored. The book is finely gotten up, with flexible covers.

*The National Formulary.* Fourth Edition, published by the American Pharmaceutical Association. 1916.

The first edition of the American National Formulary was issued in 1888. This fourth edition, representing the third revision of the original, is prepared by the committee on National Formulary of the American Pharmaceutical Association and is published by the latter's authority. It is official from September 1, 1916. After an historical introduction, a series of tables, a chapter on sterilization and various special notices, the text is divided into two parts, the first presenting the standard formulary, the second consisting of preparations dropped from the pharmacopoeia but retained in the form of an appendix. The passage of the Federal Food and Drugs Act has made the National Formulary a legal standard and placed it on a par with the Pharmacopoeia. Its source is a sufficient guarantee that it is worthy to meet the responsibility thus placed upon it.

*A Manual of Surgical Anatomy.* By LOUIS BEESLY, F.R.C.S., Edin., and T. B. JOHNSTON, M.B., Ch.B. New York: William Wood & Company. 1916.

For many years Treves' Applied Anatomy has been the standard work on this important subject in the English-speaking profession. The publication of this new Scottish work on the same subject by the demonstrators of anatomy in Edinburgh University, inevitably challenges comparison with their distinguished predecessor, but in point of fact should be more fairly judged on its own merits. It is not intended that the work should encroach on the domain of operative surgery, so that details of technique are largely eliminated. The book is compact and has been brought within the reasonable compass of 537 octavo pages by the omission almost entirely of descriptions of amputations of the limbs. With reference to tubercular disease of the bones and joints, especial attention is given to the anatomical relations of the diaphysis and the adjacent epiphysis to the capsules and synovial reflections of the corresponding joints. The book is conveniently divided into five sections dealing respectively with the two extremities, the head and neck, the abdomen and pelvis, and the thorax and vertebral column. It is well illustrated with 164 figures, many of which are colored and a few are radio-graphic. The authors are to be commended for the general adoption of the B. N. A. terminology. That they have not done so consistently is a creditable evidence of British conservatism and common sense. This new work is to be welcomed as a genuine contribution to the field of surgical anatomy in which it should fill a valuable place beside its English predecessor.



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## THE NEED FOR PSYCHIATRISTS IN THE ARMY AND NAVY.

In all the talk of preparedness it should not be forgotten that the medical branch of our military organization should be so equipped as to be able to meet any demands upon it, especially those demands arising out of the peculiarly stressful conditions incident to actual warfare. Of course we are accustomed to think of the army or navy doctor as first of all a surgeon. He must be capable of handling the cases as they come from the front,—the gunshot wounds, the bayonet stabs, the burns and the broken bones. Stationed at a lonely post in time of peace, far away from any civilian physician, he must be prepared for any emergency,—to reduce a dislocated shoulder, to operate upon a strangulated hernia or a gangrenous appendix.

To their credit he it said that the personnel of the medical branch of our service is com-

posed of men who are amply equipped, not only as surgeons, but as internists. When we consider that every one of them has had, besides his four-year medical course, a year, at least, in a general hospital and a year of post-graduate work in the Army or Navy Medical College, their high average of efficiency is explained. And yet there is one branch of medicine which it would seem should be recognized as too complex and too important to be left entirely to men who necessarily must be able to give only a small part of their studies to it. We refer to mental disease. It is hardly possible for the Army or Navy surgeon, speaking generally, to acquire a sufficient knowledge of psychiatry to do justice to such cases of mental disorder as develop naturally and sporadically under service conditions or burst into being endemically under the nervous strain of battles. The frequency of mental disease among soldiers and sailors, as well as the necessity for its adequate study, is becoming appreciated and has been written on by Bouchard, Granjux, Hanry, and Rayneau in France; Borovikoff in Russia; Schultze and Hense in Germany; and White, Richards, Smith, King, Woodson and Sheehan in the United States. It has been only comparatively recently, however, that the necessity for establishing a field hospital for the care of such cases has been understood. The first hospital of this kind was organized in Harbin during the Russo-Japanese War.<sup>1</sup>

The desirability of having their medical officers better equipped for the handling of such cases is, at present, recognized by both branches of the service; and at the Government Hospital for the Insane every winter the Superintendent, Dr. White, gives a series of lectures to the members of the Army and Navy Medical Colleges. Also it has been the custom for some years past to detail one man from each service at the Government Hospital for the Insane, to study mental disorder for two years at a time. An officer recently detailed there, Capt. Edgar King, has published an interesting account of his studies of mental disease in soldiers.<sup>2</sup> In this, among other things, he calls attention to the fact that one-fifth of all soldiers discharged are discharged on account of mental disability.

But striking as is the prevalence of mental disease among our soldiers and sailors in times

<sup>1</sup> Military Surgeon, 1910, Vol. xxxi, pp. 177-194.

<sup>2</sup> Mental Disease and Defect in United States Troops. By Capt. Edgar King, U.S.A., M.C. Bulletin No. 5, War Department.



of peace, we must remember that this would be greatly increased during war. Such, at least, has been the experience of the nations now in conflict, as evidenced by the many reports of mental and nervous affections which reach the medical press. Injuries of the central nervous system, due to the wind of explosives, hysterical aboulias developing in the heat of battle, hypomaniacal outbursts in protracted battles, nerve injuries by missiles, malingering of mental symptoms to escape active service, hypochondriasis and neurasthenia in recruits,—all these and many more will call for the intervention of the trained neurologist and psychiatrist. As White says, "A man may be quite able to get along all right,—in fact, to perform his duties with marked efficiency in time of peace,—who would break completely under the stress of war. This has long been realized as true of the physical, but we must begin now to realize it as equally true of the mental, especially as the game of war comes more and more to be played with brains."

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### MODERN CONTROL OF DRUG ADDICTION.

A RECENT sensational raid in Boston, whatever its justice and merits, has served to direct public attention anew to the prevalent evils of drug addiction and to modern methods and efforts for its control. The operation of the federal and state anti-narcotic laws has enabled a more active campaign against this evil and has gone far towards minimizing it. Unfortunately, however, although these laws largely control the supply of narcotic drugs, they do not provide for the care of drug habitués who are liable to become a miserable and dangerous class of derelicts in the community and who deserve control, treatment and restoration of health as much as any other group of unfortunate patients.

In view of the admitted incompleteness of action of existing drug legislation, there was appointed in Massachusetts, in July, 1916, a special commission to investigate the use of habit-forming narcotic drugs and to suggest measures for dealing further with the situation. The first public hearing of this commission was held on October 9 and the second on October 30. The

members of the commission are Dr. Frank G. Wheatley, Dean of Tufts Medical School, Mr. Herman C. Lythgoe, Director of the Division of Food and Drugs of the Massachusetts State Department of Health, and Mr. Abraham C. Weber, Assistant District Attorney of Suffolk County. A similar commission is working on the same problem in New York.

At the first hearing of the Massachusetts commission, the chief questions discussed were the advisability of giving the Board of Registration in Medicine the power to discipline or disestablish members of the medical profession upon the production of evidence of unprofessional conduct, evasion or violation of the provisions of the anti-narcotic laws; and the enactment of legislation taking away from druggists the right to fill prescriptions for narcotics and placing it in the hands of a state department. The latter measure was particularly advocated by Dr. Irwin H. Neff of the Norfolk State Hospital.

At the second hearing the chief topic of discussion was the advisability of establishing separate institutions throughout the state for narcotic drug habitués. It is estimated that there are 110,000 such habitués in Massachusetts and 2,000,000 in the United States.

The subject of the control of drug addiction was also considered at the annual meeting of the American Medical Editors' Association, in New York, on October 26. At this meeting Dr. Frank S. Abbott of California emphasized the importance of isolation of narcotic drug patients, and recommended the standardization of national and state laws regarding habit-forming drugs.

In another column of this issue of the JOURNAL we are glad to publish an article by Dr. Rubin of the Norfolk State Hospital, dealing with various aspects of the situation as outlined above, and especially with modern methods for the control of drug addiction. This article derives a particular pertinence from the contemporary work of the Commission on Narcotic Drugs, and at this time should arouse the especial interest of the profession, whose attention is directed to it for this purpose.

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DECLINE IN NUMBER OF BRITISH MEDICAL STUDENTS.—It is stated in a recent issue of the *British Medical Journal* that in 1913 the total number of medical students entering Cambridge University was 116; in 1914, 64; in 1915, 41, and in 1916, 25.



## TUBERCULOSIS INVESTIGATION AT FRAMINGHAM.

IN a recent issue of the JOURNAL we noted the plan of the National Association for the Study and Prevention of Tuberculosis to conduct a three-years' experimental investigation of the disease in some selected locality. On November 10, it was announced that the town of Framingham, Mass., had been selected for this purpose, for which a fund of \$100,000 is available. Dr. Donald B. Armstrong, assistant secretary of the Association, was executive chairman of the committee which made this selection after a careful canvass of many towns in Massachusetts and New York with a population of approximately 10,000. The reason for the selection of Framingham instead of its closest rival, Johnstown, N. Y., was on account of the medical supervision of public schools, the district nursing association and the excellent hospitals maintained in the former town. The committee in immediate charge of the work to be undertaken is composed as follows: Dr. Edward R. Baldwin of Saranac Lake, N. Y., president of the National Association for the Study and Prevention of Tuberculosis, and chairman of the special committee of investigation; Dr. Charles Hatfield of Philadelphia, secretary; Dr. Lee K. Frankel, sixth vice-president of the Metropolitan Life Insurance Company; Dr. Stephen J. Maher of New Haven, president of the Connecticut Anti-Tuberculosis Association; Dr. Homer Folks of New York City, secretary of the New York State Charities Aid Association; Dr. William Charles White of Pittsburgh; and Dr. Arthur K. Stone, president of the Massachusetts Anti-Tuberculosis Association, and chairman of the state trustees of hospitals for consumptives.

The work will be an experiment in community cooperation, and, if successful, will form a basis for similar anti-tuberculosis work throughout the United States with a view to the ultimate total eradication of the disease. The work will be remedial, preventive and educational.

"It is planned to give a three-months' course of lectures and clinics to the doctors of the town and to have adopted a standard diagnosis.

"Every open case of tuberculosis here will be located and cared for either in the homes or hospitals and every effort will be made to keep them from being exposed to the disease. If a person can afford to pay for treatment he will

be expected to pay, but if unable, all expenses will be paid from the fund.

"There will also be a campaign of education through the schools, churches and newspapers. In every way possible the people of Framingham will be roused to the importance of looking after their health. It will be recommended that every person in town be examined by a doctor at least once a year.

"If the experiment proves successful and the commission will have expended all the available funds, another \$100,000 will be given toward the work by a Boston philanthropist."

Dr. Allan J. McLaughlin, Massachusetts Commissioner of Health, in discussing the project, is reported as follows:

"Obviously, the demonstration is of tremendous importance to Framingham, to the State of Massachusetts and to the world at large. If a success, it will point out the way to the control and, possibly, the eradication of this great world scourge.

"It is not only a fight against tuberculosis, but also a constructive general health and disease preventive program that is contemplated. It ought to make Framingham the healthiest and safest spot on the face of the earth in which to live.

"The success of the work depends entirely upon the complete cooperation of the local and state authorities. The Framingham people have assured the national committee of their earnest and continued support. Needless to say, the State Department of Health will give every possible assistance to the work, and earnestly hopes it may be a genuinely successful fight against unnecessary and wasteful disease."

This experimental investigation is obviously one of extreme interest and its prosecution in a Massachusetts town will afford particularly favorable opportunity for observation of its progress by physicians throughout the state as well as for direct cooperation by local members of the profession.

## ACUTE PSYCHOSES OF WAR.

It may be accepted without necessity for verification that the intense emotional strain associated with warfare causes acute exacerbations of some of the milder psychotic and border-land cases which were able to get along unnoticed under the less stringent requirements of civil life. Thus, cases of arrested dementia precox, the neuroses and psychoneuroses, cyclothymia and high-grade imbecility may all be found



among recruits who have been mustered in without any suspicion that such conditions existed.

Dr. Arturo Morselli, consulting neurologist to the First Army of Italy, in a lecture to the Royal Medical Academy of Genoa, classified the mental cases which he believed originated directly from the emotional excitement of battle into seven kinds, all of which he thinks have a basis of "asthenia." The term is, of course, extremely general in its English connotations. These varieties of mental disorder he gives as acute asthenia, hysteria, depression, stupor, hallucinations, confusional states and maniacal excitement. Probably, according to the American method of classifying mental disease, we should call the first two of these conditions psychoneuroses. The depression and the excitement we should expect to find in individuals of a manic-depressive make-up, that is, the extroverted type, while the introverted type would show the stupors and the confusional states. Morselli speaks of transient hallucinations, which, of course, may arise in persons with feeble psychic resistances, that is, imbeciles, psychopaths and constitutional inferiors, from stimuli inadequate to others normally constituted—small amounts of alcohol, slight infections, mild fevers, abstinence from food for short periods, and unusual emotional stress.

The modern idea of such deviations from the normal is that they are the expression of an underlying biological defect. To the experienced observer, such cases would not, as a rule, give rise to any great difficulty in diagnosis when they presented themselves for enlistment. The life history, as given by the applicant himself, is very suggestive to the alienist, his record with the Binet-Simon, Yerkes-Bridges, Healy, Fernald and other tests, his neurological examination, all supplemented by several days' observation of him, might result in the elimination of much rotten timber which later on becomes a problem to the army in the field.

The solution which suggests itself is to have a trained psychiatrist available for consultation at every recruiting station, especially in times of war.

PREVALENCE OF DISEASES IN THE UNITED STATES.—The weekly report of the United States Public Health Service for November 10, 1916, states that during the month of September there were, in the state of Washington, 87 cases of typhoid fever, 24 of smallpox and 10 of poliomyelitis.

## PROGRESS OF POLIOMYELITIS.

DURING the past week the various epidemics of poliomyelitis throughout the United States have rapidly declined. The weekly report of the United States Public Health Service for November 17, 1916, gives the following totals of cases from July 1 to November 9 as follows: New Jersey, 3,983; Pennsylvania, 1,790; Massachusetts, 1,771; Connecticut, 881; Minnesota, 849; Illinois, 805; Michigan, 449; Maryland, 309; Iowa, 212; Rhode Island, 206; Indiana, 177; Maine, 114; South Carolina, 113.

During the first 26 days of November the number of cases reported in Massachusetts was 171, making a total of 1885 in this state since January 1, 1916. Of these, 480 cases, with 124 deaths, have been in Boston. The monthly bulletin of the Massachusetts State Department of Health for October contained the following statement relative to the disease in this commonwealth during September:

"Cases of anterior poliomyelitis continued to be reported from all parts of the state. The number for the month was 626, making a total of 1,016 cases reported to the Department since the first of January.

"The peculiar distribution of cases noted last month still continues. In the Pittsfield-North Adams area the disease has come to a standstill in Adams and North Adams, while in Pittsfield there has been a gradual increase in cases, with a further centre of infection developing in the neighboring town of Dalton. In the Greenfield-Montague area but two new cases were reported. No cases were reported from Dudley and Webster, while Worcester reported but seven cases.

"At present there are two important areas of infection, one is in the Connecticut valley with Holyoke and Springfield as a centre. In Westfield and Northampton the disease has remained quiescent. The other important area of infection is located in the metropolitan district, which last month had a low incidence of the disease. During July and August Boston reported but eight cases, while in September the number increased to 172, and many of the surrounding communities also began to report cases.

"The infection along the Merrimac River, mentioned in last month's summary, has continued active, and has extended to North Andover, Boxford, Georgetown, Newbury and Salisbury.

"The September reports were as follows: Boston, 172; Holyoke, 59; Springfield, 39; Pittsfield, 32; Malden, 18; Cambridge, 14; Newburyport, 13; Quincy, 12; Somerville and Everett, 10 each; Amesbury, Lynn, Medford, 9 each; Beverly, Chicopee, North Adams, Revere, 8 each; Worcester, 7; Adams, Auburn, Braintree,



Chelsea, Dalton, Dedham, Haverhill, Lowell, Newton, South Hadley and Warren, 5 each; 4 cases each in Brookline, Milton and West Springfield; 3 cases each in Belmont, East Bridgewater, Fall River, Leominster, Milford, Weymouth and Winchester; 2 cases each in Billerica, Blackstone, Boxford, Brockton, Danvers, Fitchburg, Hamilton, Ludlow, Melrose, Monson, Newbury, North Attleborough, Sangus, Tisbury, Waltham, West Newbury, Winthrop and Woburn; 1 case each in Agawam, Barnstable, Bernardston, Bourne, Bridgewater, Conway, Dover, Foxborough, Framingham, Gloucester, Great Barrington, Greenfield, Hadley, Hudson, Hull, Leicester, Lexington, Lunenburg, Mount Washington, Mansfield, Marblehead, Marlborough, Methuen, Middleton, Nahant, Nantucket, North Andover, North Reading, Northampton, Norwood, Otis, Oxford, Palmer, Plainville, Princeton, Rockland, Rockport, Salem, Southbridge, Southwick, Stockbridge, Stoneham, Stoughton, Swampscott, Taunton, Tewksbury, Wakefield, Watertown, Wellesley, Westfield, Westford, Westminster, Weston and Williamsburg.

**"Characteristics.**—Up to the present time the cases of anterior poliomyelitis have continued to affect the usual age group. The majority of the cases are under ten years of age. This characteristic is one of the most constant features of the disease. Any theory that will explain this infection must satisfactorily explain the constancy with which this age group of the population is attacked.

**Mortality.**—From the incomplete records received by this Department, the anterior poliomyelitis fatality rate for September was higher than for August. There were 626 cases reported, with 136 deaths; giving a rate of 21.6, as compared with the fatality rate of 15.2 for August. A more detailed analysis of these rates will be made when the final and complete figures are received from the Secretary of State's office."

The Boston clinic for the after-care of recovered cases of poliomyelitis, which was announced in last week's issue of the JOURNAL, was opened on November 21 at the Children's Hospital, under the charge of Dr. William Hall Coon, executive officer of the Harvard Infantile Paralysis Commission, under whose auspices and that of the State Department of Health the clinic will be conducted. It will be held from 9 to 11 A.M. on Tuesdays, Thursdays and Saturdays. Further plans will be later announced. The surgeons engaged in the work of the clinic at the Children's Hospital are Dr. Frank R. Ober, Dr. Arthur T. Legg, and Dr. Hale Powers. The first session of the Boston clinic was attended by 25, and the second by 15 patients.

## MEDICAL NOTES.

**CHANGES IN COST OF DRUGS.**—Report from New York on November 15 notes further recent changes in the cost of drugs, the chief variations being an increase in the cost of quinine and a decrease in that of the salicylates.

"Heavier buying of quinine, from both domestic and foreign sources, has resulted in an announcement by manufacturers of an advance of five cents an ounce to a bulk basis of 55 cents for the sulphate in 100-ounce tins. Buying for next spring's requirements has absorbed quite a quantity of the spot goods, and an advance in cinchona bark has also had some influence on the price. A revision was announced in cinchonidin alkaloid crystals to 59 cents in 100-ounce lots; cinchonidin sulphate to 35 cents an ounce; quinidin alkaloid to 93 cents an ounce; cinchonin alkaloid to 23 cents an ounce; and cinchonin sulphate to 15 cents an ounce. All minor salts of quinine are irregularly higher. Opium, morphine, and codeine have remained firm at the recent advance, \$1.50 to \$1.00, respectively, while menthol has become somewhat firmer on better demand. The salicylates and other phenol derivatives have been reduced sharply by first hands, and resale lots can again be had for less than the maker's price. Camphor is quieter and prices remain steady. The demand for opium from domestic consumers is unimportant, but export takings have been somewhat heavier. The gum is quoted at \$12 per pound in cases and jobbing lots, while the powdered and granular are maintained at \$13 per pound."

**SALE OF SPURIOUS NEOSALVARSAN.**—Report from New York on November 15 states that the Federal Grand Jury at Newark, N. J., has recently indicted two citizens of Toronto, Canada, for being concerned in an attempt to defraud the Government by smuggling salvarsan and neosalvarsan into this country. In the possession of these men was found, also, a quantity of spurious neosalvarsan which, upon analysis, proved to consist of starch and sodium chloride. It appears that during the summer of 1916 an extensive sale of this spurious product was made throughout the middle Western states and as far east as New York. The alleged neosalvarsan is put up in packages imitating the English and German brands.

**NEW YORK DEATH RATES.**—According to figures given out by Acting Health Commissioner John S. Billings, the death rate for the past week was 35 lower than the corresponding week of last year. This decrease in the death rate is equivalent to a saving of 38 lives.

The mortality of the following diseases was lower last week than during the week ending



November 13, 1915. The contagious diseases, the diarrheal diseases, cancer, tuberculosis (all forms) and diseases of the nervous system.

There were only seven deaths from poliomyelitis in the entire city during the past week. There was a material increase in the mortality of heart disease, lobar pneumonia and Bright's disease.

The total number of deaths reported during the week was 1315, equivalent to a rate of 12.28 as compared with 1324 deaths and a rate of 12.63 for the corresponding week of 1915. In the group under one year of age there was no saving of life. On the contrary, one more death was reported among infants last week than during the week ending November 13, 1915. In the group between one and five years, 24 fewer deaths were reported. The reduction of mortality in this group was due to the fewer deaths from contagious diseases, diarrheal diseases and broncho-pneumonia. In the group over 65 years of age there was a slight increase of mortality.

The death rate for the first 46 weeks of 1916 was 13.96 as compared with 13.91 for the corresponding period of last year. This is equivalent to a drop of .01 in the difference between the accumulative rate since last week. According to Dr. Billings, this is really a remarkable showing in view of the 2000 deaths from poliomyelitis this summer and the 2000 deaths during the grip epidemic last January.

**AMERICAN ACADEMY OF DENTAL SCIENCE**—A monthly meeting of the American Academy of Dental Science was held recently in Boston. Papers and discussions were presented by Dr. Charles R. C. Boardman, Dr. Charles F. Painter, and Dr. Kurt J. Thoma.

**MASSACHUSETTS STATE NURSES' ASSOCIATION.**—The autumn meeting of the Massachusetts State Nurses' Association was held in Boston on November 11. In the forenoon separate meetings were held by the League of Nursing Education and the Private Duty Nurses' League. At the general meeting in the afternoon the following papers were presented:

Education and Training for Public Health Nurse. Miss Anne H. Strong, A.B. and R.N., Assistant Professor Public Health Nursing, Simmons College, Boston.

Plan of the A. N. A. for reorganization. Miss Esther Dart, R.N.

Necessity for change in the Registration Law for Nurses. Miss Mary M. Riddle, R.N., Chairman State Board of Registration for Nurses in Massachusetts.

Presentation of "New Bill," endorsed by the Legislative Committee of the Massachusetts State Nurses' Association, the Council of the Massachusetts State Nurses' Association, and the "Joint Board of Registration in Medicine and Nursing."

#### EUROPEAN WAR NOTES.

**COMMENDATION OF GERMAN MEDICAL STAFF.**—In the issue of the *Münchener Medizinische Wochenschrift* for October 3 is quoted the following army order issued by the German crown prince on August 18, commending the sanitary staff of his army for fidelity in its discharge of duty. "The severe fighting before Verdun has placed upon sanitary service a task which could be efficiently discharged only if every individual performed his duty with the truest fidelity and unwearied devotion. I therefore express my warmest gratitude to all who, during the six months' fighting, have been called upon to care for the wounded and sick, to nurse them and to mitigate their suffering. Especial recognition is due to the surgeons, assistants and litter-bearers of the troops, and the entire personnel of the sanitary companies, who, gallantly and undismayed by the severest fire, stood faithfully beside their fighting comrades and manifested devotion to service in the most self-sacrificing manner. The consciousness of having been the saviours and helpers of their brave comrades in the hour of peril is for them and their faithful work the finest reward."

**WAR RELIEF FUNDS.**—On Nov. 25 the totals of the principal New England relief funds for the European War reached the following amounts:

Belgian Fund .....	\$178,320.91.
French Wounded Fund .....	155,213.93
Armenian Fund .....	127,143.85
German Fund .....	74,972.87
French Orphanage Fund .....	70,898.00
British Imperial Fund .....	68,720.36
Surgical Dressings Fund .....	57,994.06
Polish Fund .....	49,095.33
Permanent Blind Fund .....	28,173.86
Italian Fund .....	27,268.54
French Phthisis Fund .....	7,309.50

#### BOSTON AND NEW ENGLAND

**WEEK'S DEATH RATE IN BOSTON.**—During the week ending Saturday noon, November 25, the number of deaths reported was 263, with a rate of 18.04 against 14.63 last year. There were 37 deaths under one year of age, against 30 last year, and 82 deaths over 60 years of age, against 68 last year.

The number of cases of principal reportable diseases were: diphtheria, 34; scarlet fever, 25; measles, 8; whooping cough, 11; typhoid fever, 5; tuberculosis, 61.

Included in the above were the following cases of non-residents: diphtheria, 10; scarlet fever, 9; tuberculosis, 13.

Total deaths from these diseases were: diphtheria, 5; measles, 1; whooping cough, 2; tuberculosis, 21.

Included in the above were the following deaths of non-residents: diphtheria, 2; tuberculosis, 4; whooping cough, 1.



**HOSPITAL REQUESTS.**—The will of the late Elizabeth Claffey of Boston, who died on October 7, contains a bequest of \$100 to St. Elizabeth's Hospital.

The will of the late Sarah C. Winn of Cambridge, Mass., who died on October 3, contains a bequest of \$1000 to the Nantucket Cottage Hospital.

The will of the late Mrs. William Binney, formerly of Providence, R. I., contains a bequest of \$3000 to the Sharon Sanatorium.

**HARVARD SURGICAL UNIT.**—On November 20 a new contingent of the Harvard Surgical Unit sailed from New York for England on the Cunard steamship *Andania*. This contingent consists of twenty nurses and the following six physicians: Dr. Francis W. Palfrey, Boston; Dr. Paul Hector Provandie, Melrose, Dr. Forrest Fay Pike, Melrose; Dr. Kendall Emerson, Worcester; Dr. Henry B. Potter, Wakefield, R. I., and Dr. Chauncey N. Lewis, Boston. It will relieve the members of the unit now on service at Hospital No. 22 of the British Expeditionary Force in France whose term expires on December 9.

**BOARD OF HEALTH OF PAWTUCKET, R. I.**—The recently issued annual report of the City of Pawtucket, R. I., records the prevalence of reportable diseases for the year 1915 as follows: diphtheria, 125 cases with 9 deaths; scarlet fever, 61 cases with 2 deaths; typhoid fever, 10 cases with 8 deaths. A case of leprosy, confined at the detention hospital, died in March, 1915.

### Miscellany.

#### MASSACHUSETTS STATE DEPARTMENT OF HEALTH.

##### RÉSUMÉ OF COMMUNICABLE DISEASES FOR OCTOBER, 1916.

**PREVALENCE.**—In spite of the excessive number of cases of infantile paralysis reported during the current month, the total number of cases of communicable diseases reported to the Department is considerably lower than the total for the corresponding month last year, and only slightly higher than the total for the previous month of this year. All of the diseases, with the exception of anterior poliomyelitis, smallpox and mumps, show a marked decrease over last year's figures for October, especially diphtheria, typhoid, and whooping cough.

**SMALLPOX.**—Cases of smallpox appeared in Lee and Great Barrington during the month of October. Its origin was apparently a missed case which occurred back in August, imported from another State. During the months of August, September, and October, nine cases in all have occurred. An interesting fact is that in only one of these instances is there a history of vaccination having been performed, and in this case it did not take and was not repeated.

**ANTERIOR POLIOMYELITIS.**—Based on estimates from the incomplete records received, the fatality rate for anterior poliomyelitis for October bids fair to be a little lower than that for September. The fatality rate for September was 24.7.

It will be noted that there is an increase of 80 cases of infantile paralysis in October over the num-

ber credited to September, making a total of 703 cases for October. This increase has been largely in the Metropolitan area. Boston heads the list with an increase of about 57; Quincy with one of 33; and Cambridge with one of 22. The disease still persists in the western part of the State, but a diminution in intensity in that section is apparently perceptible.

Following is a list of towns in which infantile paralysis has appeared for the first time during the month of October: Andover, Amherst, Athol, Attleboro, Belchertown, Cheshire, Deerfield, Dennis, Easton, Ercmont, Grafton, Halifax, Hatfield, Holbrook, Hopkinton, Longmeadow, Ipswich, Manchester, Mashpee, Natick, Northboro, Northbridge, Swansea, Templeton, Walpole, Wenham, Westwood, Warwick, Whitely, Wilbraham, Wilmington.

**DISTRIBUTION.**—All Communicable Diseases: Total cases Sept., 1916, 3130; Oct., 1916, 3260; Oct., 1915, 4550.

Case rate per 100,000 population: Sept., 1916, 83.0; Oct., 1916, 86.0; Oct., 1915, 120.6.

**COMMON DISEASES.**—*Diphtheria*: Total cases Sept., 1916, 470; Oct., 1916, 620; Oct., 1915, 1225.

Case rate per 100,000 population: Sept., 1916, 12.4; Oct., 1916, 16.4; Oct., 1915, 32.4.

*Hemlock*.—Total cases: Sept., 1916, 175; Oct., 1916, 250; Oct., 1915, 361.

Case rate per 100,000 population: Sept., 1916, 4.6; Oct., 1916, 6.6; Oct., 1915, 9.6.

Cities and towns which have exceeded their endemic index:\*

North Attleboro .....	(1) 13
Malden .....	(15) 22
Belmont .....	(0) 6
Webster .....	(2) 9
Ludlow .....	(0) 10
Westfield .....	(2) 14†
Reading .....	(0) 16
Lowell .....	(7) 32
Framingham .....	(3) 19
Gardner .....	(1) 12
Leominster .....	(0) 60
Northampton .....	(0) 20

*Scarlet Fever*.—Total cases: Sept., 1916, 203; Oct., 1916, 309; Oct., 1915, 480.

Case rate per 100,000 population: Sept., 1916, 5.4; Oct., 1916, 8.3; Oct., 1915, 12.7.

*Typhoid Fever*.—Total cases: Sept., 1916, 373; Oct., 1916, 180; Oct., 1915, 410.

Case rate per 100,000 population: Sept., 1916, 9.9; Oct., 1916, 1.8; Oct., 1915, 11.7.

*Whooping Cough*.—Total cases: Sept., 1916, 271; Oct., 1916, 172; Oct., 1915, 649.

Case rate per 100,000 population: Sept., 1916, 7.2; Oct., 1916, 4.9; Oct., 1915, 17.2.

Cities and towns which have exceeded their endemic index:

Norwood .....	(1) 7
Woburn .....	(2) 7
Worcester .....	(15) 31
Springfield .....	(50) 67
Westfield .....	(1) 17
Montague .....	(0) 8
Fall River .....	(16) 29
Lynn .....	(8) 15
Quincy .....	(1) 7
Clinton .....	(1) 22

*Tuberculosis*. The number of cases of tuberculosis, all forms, reported for October, 1916, shows a falling

\* Endemic index signifies the average rate for each of the reported cases per 100,000 population. The index is calculated by dividing the town for each month by a certain number of cases. The number is then ascertained after the sum of the cases for each month is divided by the number of months. The index is then multiplied by 100 to obtain the endemic index. The index indicates the cases reported during the current month.

† Nine cases reported in the City of Boston.



off over those of the previous month, and a still greater decrease over the figures of a year ago. Part of this, at least, may be ascribed to a better system of "weeding out" cases reported more than once to this Department.

*Tuberculosis, pulmonary.*—Total cases: Sept., 1916, 62; Oct., 1916, 53; Oct., 1915, 732.

Case rate per 100,000 population: Sept., 1916, 15.9; Oct., 1916, 14.3; Oct., 1915, 19.4.

*Tuberculosis, other forms.*—Total cases: Sept., 1916, 58; Oct., 1916, 51; Oct., 1915, 85.

Case rate per 100,000 population: Sept., 1916, 1.5; Oct., 1916, 1.4; Oct., 1915, 2.3.

*Rare Diseases.*—Anthrax was reported from Woburn (1), and Dartmouth (1).

Cerebrospinal meningitis was reported from Chleopoe (1), Clinton (1), Lawrence (1), Lowell (1), Mattapoisett (1), Worcester (1) and Boston (5).

Dysentery was reported from Newton (2), Worcester (1), and Boston (16).

Dog-bite (requiring antirabic treatment) was reported from Great Barrington (1).

Pellagra was reported from Leominster (1), Monson (1), and Boston (1).

Septic sore throat was reported from Fall River (1), Amherst (1), Freetown (1), Lynn (1), Georgetown (1), Haverhill (1), and Boston (1).

Tetanus was reported from Lowell (1), Dartmouth (1), Lawrence (1), and Salem (1).

Malaria was reported from Fall River (5), and Wellesley (1).

Trachoma was reported from Leominster (2), Bridgewater (1), and Boston (2).

#### OCCUPATIONAL DISEASES.

DISEASE	OCCUPATION	SEX	AGE	COLOR
Lead poisoning	Painter	M.	24	W.
Lead poisoning	Car painter	M.	35	W.
Lead poisoning	Ship worker	M.	22	W.
Lead poisoning	Melter	M.	48	W.
Nitrous fumes	Dye mfg.	M.	41	W.
Lead poisoning	House painter	M.	25	W.
Lead poisoning	Painter	M.	44	W.
Lead poisoning	Rubber mixer	M.	37	W.
Lead poisoning	Ship building	M.	53	W.
Anthrax	Flesher	M.	23	W.
Lead poisoning	House painter	M.	25	W.
Lead poisoning	House painter	M.	35	W.
Lead poisoning	House painter	M.	32	W.

### UNITED STATES CIVIL SERVICE EXAMINATIONS.

#### DENTAL INTERNE (MALE).

The United States Civil Service Commission announces an open competitive examination for dental interne, for men only, on December 13, 1916. From the register of eligibles resulting from this examination, certification will be made to fill a vacancy in this position at \$600 a year, with maintenance, in Saint Elizabeth's Hospital, Washington, D. C., and vacancies as they may occur in positions requiring similar qualifications, unless it is found to be in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion.

The department states that it reserves the right to terminate the appointment at the expiration of one year of service if it is deemed advisable to do so.

In addition to many interesting cases presented, the dental interne is given an excellent opportunity for study and for doing experimental and research work in the pathological, histological, and other laboratories of the institution.

Applicants are required to be graduates or senior students of regularly incorporated dental colleges, and applications will not be accepted from persons who have graduated for more than two years. The names of senior students will not be certified for

appointment until they have furnished proof of actual graduation.

Statements as to training and experience are accepted subject to verification.

Applicants must be unmarried.

Age, 20 years or over on the date of the examination.

No sample questions of this examination will be furnished.

This examination is open to all men who are citizens of the United States and who meet the requirements.

Persons who meet the requirements and desire this examination should at once apply for Form 1312, stating the title of the examination desired, to the United States Civil Service Commission, Washington, D. C. Applications should be properly executed, excluding the medical and county officer's certificates, and filed with the Commission at Washington in time to arrange for the examination at the place selected by the applicant. The exact title of the examination, as given at the head of this announcement, should be stated in the application form.

#### PHYSICIAN (MALE).

The United States Civil Service Commission announces an open competitive examination for physician, for men only, on December 13, 1916. From the register of eligibles resulting from this examination, certification will be made to fill vacancies in this position in the Indian and Panama Canal Services, and vacancies as they may occur in positions requiring similar qualifications, unless it is found to be in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion.

The entrance salaries in the Indian Service range from \$1000 to \$1200 a year, and in the Panama Canal Service are \$1800 a year.

As the supply of eligibles resulting from recent examinations has not been equal to the demand, qualified persons are urged to enter this examination.

Applicants must be graduates of or senior students in recognized medical schools. The names of such senior students will not, however, be entered on the eligible register in the event they pass the examination, until they have furnished proof of actual graduation.

Statements as to training and experience are accepted subject to verification.

Applicants must have reached their twenty-first, but not their fortieth, birthday, on the date of the examination.

Applicants must be in good health, and must attach to their applications a statement showing the number in their family dependent upon them that will require accommodations at the Indian School or Agency in case they receive appointment.

No sample questions of this examination will be furnished.

Applicants must submit to the examiner on the day of the examination their photographs, taken within two years, securely pasted in the space provided on the admission cards sent them after their applications are filed. Tintypes or proofs will not be accepted.

This examination is open to all men who are citizens of the United States and who meet the requirements.

Persons who meet the requirements and desire this examination should at once apply for Form 1312, stating the title of the examination desired, to the United States Civil Service Commission, Washington, D. C. Applications should be properly executed, including the medical certificates, but excluding the county officer's certificate, and filed with the Commission at Washington in time to arrange for the examination at the place selected by the applicant. The exact title of the examination as given at the head of this announcement should be stated in the application form.



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## Address.

### PREPAREDNESS FOR HEALTH.\*

By HAVEN EMERSON, M.D., NEW YORK,

*Commissioner of Health.*

YOUR yearly meeting to pay a debt of gratitude to those who made possible a gentler art of diagnosis, a quicker and safer skill in treatment and cure, has brought forth such tributes that I may safely leave the honors earned as they appear upon the record.

How suitable is our place of assembly, this generous and spacious building, the centre from which the guiding hand will direct the hospital family, the storehouse of priceless inventories of physicians' labors, the custodian of still unexplored treasures certain to bring forth gifts at the open sesame of the diligent student, broad in scope and with a view to future usefulness far beyond the imagination of the founders of this great educational institution.

To mobilize the knowledge and service of today is a privilege no less than to advance bit by bit the borderline of facts. And here we see provision for the one, and opportunity for the other. To my mind the best hospital is the one which succeeds in keeping the largest number of people out. To prevent the little disorder of today from becoming the serious operative risk of tomorrow, is an ideal to which that

greatest of all parts of a hospital, the clinic or dispensary, is devoted. But why wait until the patient comes to complain? Why not entice them to come to libraries, lectures, friendly personal visits, such intimate consultations for advice as have made the name of family physician, village minister, and parish priest beloved the world over?

Many of the big troubles the patients bring to your doors have their little beginnings in carelessness, misinformation, lazy habits, weak character and self-indulgence; and when you have set them on their feet and returned them home with a God-speed, you are not rid of them unless you have taught them while you have treated them.

The hospital of the future—and surely none by its past has so well earned the right to be among the greatest in the land for all time as this one—will have on its records and to its credit a life of histories marked *Case not admitted; sickness prevented by education.*

"To be used; that is the sublimest thing we know." So the gentle David Grayson inadvertently described the wish and hope of the servants of the common good who enjoy their work for the work's sake.

It is by cooperation and not merely by competition; by the persuasion of helpful ideas and not with destruction of things or people; it is in being for a principle and not by being against persons that the spirit of preparation and patriotism is developed in a community.

Preparedness; to make ready beforehand, to make ready for some particular purpose or service, to put things in suitable order, to be in a

\* Ether Day Address. Delivered upon the occasion of the opening of the Moseley Building at the Massachusetts General Hospital, October 16, 1916.



state of readiness, to adjust, to adapt,—this is the plan of the prudent citizen. Disagreement upon this is impossible, at least to the accidental.

For what, then, shall we be in readiness? To what shall we adjust ourselves? What shall be the nature of our preparations?

The answers will be as various as the ambitions of each one of you. In this great household of relief, this home of the helping hand, the privilege may be allowed me to take it for granted that at the moment you think of and feel with one accord the overwhelming call to make this country not only a place for freedom in religious observance and freedom of speech, but a land free from the burden of preventable disease.

"Preventable" is a word to conjure with, for no sooner is the true cause of sickness announced than the possibilities of prevention come knocking at the door. So we see the whole array of philosophy and science assailing the mountains of ignorance and returning from time to time with new trophies, called by the physicians the etiological factors, the specific or determining causes of disease. It is upon no short and easy path we are set out. The goal will continue to recede, the list of preventable diseases continue to grow, and by so much will our duty be enlarged.

If we can believe the somewhat dim records of early civilization, infectious and epidemic diseases were recognized then, and to meet them, racial and religious habits developed. Later, when mankind created an artificial environment and began to try his hand at wresting pleasures and comforts from resistant nature, there came upon him misfortunes created by his own personal habits. Again we find restraint and advice supplied by governments of church or state.

When man thereafter began to exploit not only nature but his fellow man, there sprang a host of new and insidious diseases which have made such inroads upon community and national existence in all lands that a voluminous body of civil law has been created in an effort to correct the health hazards of industry. With fair accuracy, then, we may divide the problem of health protection into:

1. The prevention of communicable diseases.
2. The correction of habits which determine or contribute to premature death.
3. The prevention of industrial hazards.

Under one of these three headings we can properly place most of the activities of the present-day campaign for health as a personal or a community problem. But bear with me a moment while I call to mind a preliminary which should be observed before attempting any new experiment. For a control and to establish a measure of results, we must know how many are there of us, how many are the annual recruits in the nurseries, and what the

afflictions are that draft so many to the army of the silent.

As the bookkeeper and accountant are the recorder and analyst of business transactions, so the registrars of births and deaths provide the means of assessing the results of public health administration.

What community is so dull as to be uninterested in its continued existence? Self-interest drives the sick patient to seek relief from pain and disability by appeal to his family physician. Shall not the village, city or state require at least an equivalent service of diagnosis, prevention and treatment for its various disturbances of community function, the destruction of its several members?

The merchant accepts our past experience as a guide to the need of future supplies; the salesman counts on publicity and education to create a demand for his wares. Shall our cities or our nation ignore their greatest asset, and fail to count the daily loss of lives as inexcusable? And yet—to our shame be it said—we, who claim to be a civilized nation, have still so cheap a notion as to life and death that we are without a national registration law or uniform state laws demanding the reporting of births and deaths.

In the councils of the world there is no record of the accomplishments of the United States as a whole in the field of preventive medicine and sanitation. True, honor is given to the great men of science produced here, but neither the birth rate nor the death rate of all the states is known. Are we so young, so satisfied with local accomplishments and excellences, that we can remain indifferent to the insufficiency of the very elements upon which constructive social statesmanship must be founded? Only 66% of the population of the United States lives in states where the registration of deaths is compulsory, and less than 31% live where registration of births is required. Only two-fifths of the area of the United States are included in the registration area for deaths, and but 10% of the land area of the United States is included in the registration area for births. Failing the national figures, which should have been available for the past hundred years, I may be excused if I use the records of New York City, which has just completed a half century of experience with a department of public health.

The yearly death rate has fallen from 29 per thousand to 14 per thousand of population.

Deaths from cholera, smallpox, yellow fever, typhus fever and malaria have all but disappeared from our records. In the first ten years there were 6260 deaths from smallpox. In the past ten years there were 7.

Deaths from tuberculosis, typhoid fever, puerperal fever, infantile diarrhea, diphtheria, and scarlet fever have shown a reduction of from 50% to 90% in this half century.

Since the incorporation of the greater city in



1898, the yearly death rate has been reduced 31%.

But best of all is the brilliant result of the scientific attack upon the infant mortality rate, which has fallen from 242 per 1000 living births in 1891 to 98 per 1000 births in 1915, and in the past five years from 170 to 98 per 1000 births. Whereas only 80% of the babies born in 1898 lived through their first year, now more than 90% survive. When this saving of lives was begun, there were those whose lack of confidence and information did not carry the conviction that this baby saving was an ultimate benefit to the community. Thanks to the data now available, we can answer with courage and certainty that the saving continues right up to the school age, and that the babies saved are the worth-while lives. The deaths were not inevitable and merely postponed a few months or a year or two. If the death rate of 1866 had prevailed in 1915, we should have lost in New York City last year 88,000 people who are now living.

The details of the methods by which these results were obtained in New York City, as in other cities and states here and abroad, need not concern us. This is not a year to dwell upon past victories, but to take thought lest in the onrush of events we find ourselves complacently satisfied with our successes, while our neighbors and, in terms of national existence, our competitors, may soon be striding past and beyond.

Remember that while there are the thousands killed in Europe in battle, more people are killed by preventable disease annually in this country than the annual loss of any nation in the present war.

Let us rather face the record and plan for our own more creditable future. To pick out three typical failures, we may properly consider why we still lose our thousands from tuberculosis, alcoholism, and among industrial workers.

Out of 75,000 deaths a year, we lost 31,700 from causes which are largely, if not wholly, preventable. Last year, in New York City, with a total population of 5,602,841 and a total death list of 76,193, there were 10,249 deaths from tuberculosis, and 1597 deaths admitted to be due directly to alcohol, and, as all pathologists and physicians in general hospitals or private practice know, the recorded deaths from alcohol represent but a fraction of the deaths really attributable to this drug, if not as the sole factor, as a contributory or determining cause.

There were 2596 deaths from diphtheria, scarlet fever, measles and whooping cough, and may I in parenthesis ask you to note that this is our annually recurring number, and is larger by more than a hundred than the total deaths from poliomyelitis in our recent epidemic.

Preventable accidental deaths numbered 2509, exclusive of deaths from violence and homicide and suicide.

We still lose 13,866 children under a year of age.

If we count at least 10 cases of sickness or temporary disability for each of the deaths above listed, we reach a total of 317,000. Evidently there is sufficient work ahead to keep us upon the tiptoe of endeavor.

In tuberculosis the first defect in control comes when the physician fails to make an early diagnosis. This failure must be shared equally by the patient and the private practitioner. One hardly ever sees an early case of pulmonary tuberculosis in our colored population. They are childlike in their optimism, and they neglect even the simplest precautions. They fail to obtain medical advice of any kind until seriously disabled. They must be taught to seek advice earlier,—a need worthy of a great leader.

When the state sanatorium for incipient tuberculosis was first opened at Raybrook, N. Y., early cases were sent only by a few physicians in some of the large cities, and this state of affairs persists to a serious degree at the present time, so that it is apparent that patients must call the physician earlier and the standards of diagnosis must be raised before we can make maximum use of our present knowledge as to the arrest of the disease. Perhaps the solution will come through a habit of annual or semi-annual medical examination of everyone, and such a habit would justify the time, attention, and small cost involved, if for no other reason than that many a case of tuberculosis would thus be noted and be promptly put in the curable class.

Twenty physicians of the Health Department examined 20,357 food handlers last year and found 1 in 1000 suffering from pulmonary tuberculosis. When 1116 private practitioners, for pay, examined 26,300 in the same industrial group, they found 1 among 3700 tuberculous.

There was a similar and equally serious discrepancy in the incidence of venereal diseases, as reported by the two groups of physicians. The Department of Health physicians discovered, among the 20,357 food handlers examined, 111 syphilites and 22 cases of gonorrhea. The private physicians discovered, among the 26,300 food handlers examined, 7 syphilites and 5 cases of gonorrhea. Of the 5 cases of gonorrhea, all but one were reported by the examining physician of a large railroad corporation.

There is much food for thought in these results. The clinical material under observation was as nearly uniform in the two groups as can well be imagined. The examining physicians of both groups were, in the main, graduates of the medical schools of New York City.

In the case of the private practitioner there was the opportunity of a new and considerable source of income, and remuneration in fair proportion for the time consumed, and there was the same responsibility to detect disease as is assumed when a patient calls at a physician's office frankly complaining of sickness. The food



handlers considered themselves healthy when applying for examination.

The Department physicians, drawn from the same professional ranks, working on a salary, were responsible for a methodical performance of a set task under the supervision of trained diagnosticians, and they discovered proportionately 3.7 times as many cases of pulmonary tuberculosis as the private physicians. And to make it quite clear to you that the Department physicians, working at the occupational disease clinic and not trained as specialists in tuberculosis, were well within the mark, I must remind you that there are a little over seven cases per 1000 of the population in the city at large.

The query is inevitable; are private practitioners in the by and large, ready to detect disease in people who assert that they are healthy? Is the public sufficiently protected at present, if the symptoms of disease must be declared by the patient before it is named and treated by the physician?

As patients come to the tuberculosis dispensaries in New York City, the story is too often told, that the family physician has been treating for weak lungs for some time, but has never examined the bared chest or made a microscopic examination of the stained sputum. Unless such stories become a thing of the past, the community will revolt against medical services upon a personal basis. Such medical service is disgraceful and should not be tolerated. Excusable, perhaps, before 1882, when Koch proved the tubercle bacillus to be the cause of the disease, or before 1819, when Laennec demonstrated tubercular disease of the lungs by physical examination of patients; but generations of physicians have been taught since then, and still there are physicians who practise tongue and pulse medicine blissfully oblivious that diagnosis is capable of treatment as an exact science.

With our present knowledge, secondary cases of tuberculosis in a family are a needless waste of life. We know the cause, and enough of the mode of transmission to prevent infection, but it is easier to treat from an office chair by pen and pill, than to become the actual teacher and family instructor in the home, weeks and months on end, so that the facts known are used by the people exposed.

Are we forever to await the call of the sick patient before giving service? Must we sit by and see that for every 1000 children living in certain blocks of every city, so many will become infected with a preventable disease, as to which we know the specific cause and the means of transmission?

If New South Wales has found it possible to have every person examined by competent physicians, every infected person isolated or so controlled at home as to break the endless chain of transmission, and thus to bring pulmonary tuberculosis to an end in that commonwealth

and prevent the entrance of infected people in the future, is there not a service worthy of an effort here? Is it good government, or utter social neglect to permit incompetent physicians to continue to practise years after they have ceased to learn, or have become incapable of applying the facts upon which prevention of disease must rest? Is not the public interested?

Shall we continue to permit the construction and occupancy of buildings in every city in the country, and in many of our rural regions, unfit for human needs and certain to lend themselves to the development and perpetuation of sickness?

And with syphilis it is no different. Eight per cent. of push-cart peddlers have been found to be syphilitic; 25% of the children and adults admitted to a great orthopedic hospital show positive Wassermann reactions.

Here, again, we are confronted with the dual failure. The spreader of the disease fails to obtain diagnosis and treatment that will put an end to his particular infection, and the physician fails to report the disease and to insist upon such personal habits and persistence of treatment as will alone prevent danger to others. Have we the courage to adopt an honest and rational program such as has recently been established by law in Western Australia, and has been in force in Denmark for the past ten years? This law holds the patient and the physician equally responsible,—the patient to obtain immediate treatment and persistent care until cured, the physician to report the case, teach, caution, and treat the patient, if necessary at public expense, and under restraint, until the possibility of transmission is at an end.

Why allow competition to determine the distribution of medical services? Why is there one physician to three hundred and fifty-six persons in Hampstead, and one physician to five thousand five hundred and eighty-two in Shore-ditch in London? Why is the proportion in New York City, one to five hundred and eighty-nine in Manhattan and The Bronx, and one to fourteen hundred in Queens? After a man or woman has been taught through the endowments of elementary schools, colleges, medical schools and hospitals, and has arrived at the age of from 25 to 30, so far unproductive, are we to consider that the community owes them a living or that they owe the community a life?

Is competition for money to determine the future progress of the graduated physician, or is he to be a public servant drilled and trained to play a most responsible part in our modern economic and social structure? Is the public need to determine their training, their location, and their income, or will these all be determined by the question of largest financial return? Physicians have committed themselves to a process of voluntary self-elimination, and society will not easily accept them now or in the future on the basis of individual competition for money,



which determines the number and distribution and capacity of other professional groups.

Shall the physician continue to be at the beck and call of the lady with a severe case of lack of occupation, and must he kowtow to the business magnate whose disease-breeding tenements are largely responsible for the consumption rate?

Shall the hospital be filled by those who want to go and can afford the price, or by those now waiting outside, whom the dispensary physician knows must lead a handicapped existence for lack of the very luxury of rest in bed, from excess of which my lady-do-nothing suffers? The wrong people are generally in hospitals. The selection is made more by means than by needs.

Shall the hospital retain the seclusion of its walled privacy and await the coming of the lame and fevered, or shall it become a high school for health, with extension lectures, a reference library on personal hygiene, a centre for organized consultation, a seat of preventive medicine?

We lose each year in New York as many lives from alcoholism as the devastating epidemic of infectious colds cost the City of New York last winter, as many as all the deaths from the epidemic of poliomyelitis, which has raised the whole Eastern coast of this country to a point of panic. And what is to be done, and what has been done to prevent these regiments and more from marching this year, as last, out of New York City to the graveyards? Education coupled with enthusiasm must not be mistaken for fanaticism. Legislation has never changed habits, but may follow a change in popular convictions.

To convince the people of this country that the use of alcohol internally is to their disadvantage would seem a simple matter to anyone with an elementary understanding of physiology, and the action of the anesthetic group of drugs.

What nurse or doctor who has had a hospital service, but has seen enough to make each one a permanent crusader for a non-alcoholized society? And yet we find physicians permitting the use, condoning its use, yes, prescribing alcohol with a freedom which cannot but make them pause and consider when the stories of the habitués come to their ears. So strong is the inertia of habits, so vast the momentum of large industries, that it will take years of teaching to wean our people from this, their worst dietary enemy. Must we wait for a national calamity to shock us into appreciation of the extravagance of our wasted lives? I think it is fair to say that no single thing would make so immediate a change in the whole list of causes of death in adults as the abandonment of the use of alcoholic beverages. Every group of preventable diseases in adults would show a diminution in incidence and in death rate. And

among children, too, it predisposes to various ills and weakens resistance to infections.

The education of public opinion and private habits is at present the only reasonable and promising measure at the service of the public health officer and the private practitioner in the effort to have the general use of alcoholic beverages, and the largest single cause of poverty and sickness, abandoned. Other habits also, as to housing, eating, personal cleanliness, recreation, etc., are certain to be modified by education, and in no other way.

As for the third class of general conditions in which we now fail to protect and prevent, the most recent and, in many ways, the most interesting as a public health problem, I shall ask you to note the widespread interest in tariff protection for the new chemical industry so extensively developed here from force of circumstances abroad. The halls of Congress were vigorously assailed in the interest of those who saw our opportunity, with governmental support, for the creation of a great and lucrative commerce at home and abroad. Protection is what they clamored for; protection of the chemical products against the keen and undoubtedly effective competition certain to develop when the bans are again removed from international trade.

More attention has been paid to the protection of industrial workers in Germany than anywhere else in the world, and the most recent report indicates that in the large chemical works in Germany, with the improved sanitary conditions, the sick rate is 54.9% of all employees per annum, with an average duration of sickness in each case of 17.8 days.

Among 185,820 employees in the chemical industry in Germany, in 1905, there were 163,522 cases of sickness, or 88% of all employees, with an average duration in each case of sickness of eight days.

Let the public take an active interest with the employer and the employee to see that the workman, who produces, is protected in this country; for it is obvious to the student of causes of death that the protective tariff upon a product may prove too high a price to pay for the doubtful security of carrying on with profit, trades which throw back into the community so many disabled workmen.

Are not the lessons of the day clear enough for us to see that the population of the wards of the hospital are the measure of our inefficiency?

How many admissions to the wards are sufferers from preventable defects? Strike off your hospital census those who have tuberculosis, or syphilitic lesions, and where is your overcrowded ward?

Count off the patients disabled from neglect of hazards of occupation, count those who pay their final reckoning for the life-long use of al-



cohol, and you see a dwindling line of beds and a short service in the operating room.

What the autopsy table is to the visiting physician and the surgeon, the hospital ward is to the health officer. There he is faced with his failures.

And why, you ask me, did I take the trouble to expose the failures or shortcomings of our present system, or lack of it, in view of the record of accomplishment of the past fifty years? Briefly, because the promise of the future cannot be fulfilled unless and until all physicians coöperate for the public good, as well as competing for private livelihood, and unless we make available for all, services in diagnosis, prevention and treatment of disease of the quality which now is doled out at a price for the few, given freely to the very poor, but unobtainable for people of moderate means.

One competent physician, in touch with and capable of using the resources of special diagnostic laboratories, and free to call consultants to his aid, will replace ten bunglers who at present survive only because the ignorance of their patients is denser than their own; will save more lives, abbreviate sicknesses, and at a cost far less than the tax for inefficiency now paid by the uninformed public.

Whether by organization, by endowment, or by state employment, it seems to me that there must come a change in the basis of medical practice.

Preparedness for health in any state or community requires for the prevention of communicable disease, accuracy in early diagnosis by the family practitioner, and such means and knowledge as to care and treatment as will shorten the period of communicability to the minimum, and limit the contact between the sick person and the rest of the community to those who are insusceptible or to places where the conditions of residence and supervision will prevent exposure.

Segregation of the infected individual in hospitals and sanatoria should become so universal for all communicable diseases that general hospitals and private establishments would serve the purpose now met chiefly at state and municipal expense. The pest house is the mediaeval conception which still clings about the idea of an isolation building. There should be a cheerful welcome and adequate provision for communicable diseases in every general hospital, with a medical and nursing service, capable of a technic equivalent to that of aseptic surgery, which can meet the modern needs of sanitary science and bring results in treatment and cure as brilliant and creditable to physicians as have been contributed by the surgeons. The public would be better protected, the treatment of infectious diseases would be improved, doctors and nurses would learn much which now they miss in a general service.

To alter habits which we know diminish resistance to disease, and limit the capacity for

intelligent endeavor and put a serious burden upon the community because of dependency in later life, we must teach the children of the schools, the parents in the homes, the men and women in the shops and factories, the patients and dependents in our dispensaries and hospitals, such simple truths as will encourage them to require and maintain clean, light, and airy living rooms, to avoid entirely the use of alcohol and patent medicines, to proportion their food to their needs, and to consider physical fitness not only a priceless inheritance, but its maintenance a national duty.

Before the inevitable victory over industrial disabilities can be complete, or the abatement of conditions which cause an annual loss from avoidable illness equal to the national debt, is accomplished, it must be borne in upon the minds of those who employ their fellow men that of more value than the product is the producer. The employers, the public and the employees are jointly responsible for conditions causing sickness among wage-earners and their families. The employer's legal responsibility is generally limited to the places of employment and working conditions. The public is responsible for community conditions common to all classes of citizens. The greater share of the burden as to cost and remedy lies upon the workman himself, but as he is unable to meet this responsibility single handed, it rests with the public and the employer to share with him the cost, and to determine the character of the service needed.

Thirty-five per cent. of the wage-earners of this continent must ask for public or private charity when disabled by disease. Shall it be said that we are so selfish, so short-sighted, so wasteful, that we prefer to pay a bill for damages, when health and time and economy are all to be had by paying for prevention?

The burden of giving free treatment to the victims of industrial hazards can no longer be carried by the medical profession. When the state, the employer, and the employee contribute to defray the cost of medical services for the prevention and relief of occupational disease, it will be reasonable to expect the medical profession to submit to a degree of periodic re-examination and continued compulsory training which, up to the present time, has existed only in the medical branches of our federal services. In the medical services of our federal government, re-examination is required periodically even to remain in grade, and advancement is only on examination. Attendance at post-graduate medical course periodically is compulsory.

In the Department of Health of the City of New York, advancement from grade to grade in the medical positions cannot take place without competitive examinations. Failure to earn average rating for efficiency for three successive quarter years of service results in the bringing of charges of incompetency against a physician..



Why allow all the glory to go to those who have reduced the death rates in the occupation least productive of national progress, the occupation of arms?

Between 1880 and 1916 the death rate among the native troops in India was reduced from 41 to 3.7 per thousand, and for British troops in India from 24.8 to 4.3; and similar results are within our reach in the vastly larger army of industry.

Of what avail to keep the policeman in perfect health if the families he protects from violence and theft are allowed to suffer from loss equally discreditable to representative government?

Scientific coöperative medical service promptly summoned and consistently obeyed; education in the ways of right living, from the training of the expectant mother, through the schooling of her child, and until the new home is started in the next generation; union of effort by the state, the employer, and the employee, to prevent wastage from occupational disease. Upon these principles of action must our social program for national service be built.

It is not a conflict with the popular clamor for a military and naval preparedness that I suggest, not a hindrance to commercial preparedness for greater national wealth, but a warning of the futility of both of these without the assurance that the first need and greatest asset of a nation, its health, should take the leading place in your thoughts.

In closing, may I quote from that sensitive student, that sharp analyst of society in the last century, Thomas Carlyle: "Men cannot live isolated. We are all bound together for mutual good or mutual misery as living nerves in the same body. No highest man can disunite himself from the lowest."

There is nothing so democratic as disease, no bond so strong as the appeal of suffering fellow men.

I beg of you to consider the merits of the philosophy of prevention of disease, a worthy development of modern medicine, and I ask you to devote at least part of your lives to the encouragement of preparedness for health.

**MASSACHUSETTS SOCIETY FOR MENTAL HYGIENE.**—The annual conference of the Massachusetts Society for Mental Hygiene will be held at Ford Hall, Boston, on December 13, 14 and 15. Among the speakers at the opening session will be Dr. Walter E. Fernald of Waverley, Dr. E. E. Southard of the Psychopathic Hospital, Judge W. T. Forbes of Worcester and Dr. F. E. Williams, chairman of the advisory prison board. Prof. W. H. Burnham of Clark University will preside and Lt.-Gov. Calvin Coolidge will be a vice-chairman. It is expected that proceedings of this meeting will be published in subsequent issues of the JOURNAL.

## Boston Psychopathic Hospital.

### THIRD ANNUAL CONFERENCE ON MEDICAL AND SOCIAL WORK, JUNE 18, 1915.

#### SPINAL FLUID SUGAR.\*

BY J. B. RIEGER, S.M., AND H. C. SOLOMON, M.D.,  
PSYCHOPATHIC HOSPITAL, BOSTON.

ESTIMATIONS of the reducing sugar content of the spinal fluids of 124 male, and 51 female subjects, in the main, psychopathic, gave values ranging from 0.050-0.090, or a grand average of 0.070%. The extremes, obtained in certain diabetic and inflammatory conditions are not here included. In general, the higher values have always been found in the more robust subjects, and aside from this, the range is the same in the psychopath as in the non-psychopath, in the male as in the female, and in the young as in the old.

The diagnoses made on these subjects are: general paresis, 47; dementia precox, 30; alcoholism, 22; manie-depressive insanity, 12; epilepsy, 6; diabetes, 6; juvenile cerebrospinal syphilis, 4; adult cerebrospinal syphilis, 5; arteriosclerosis, 4; pellagra, 2; tubercular meningitis, 1; hypopituitarism, 1; chorea, 2; tabes, 4; miscellaneous psychoses, 20; not insane, 10. On this basis the following values are remarkable: diabetes, 0.134-256%; pellagra, 0.90-0.102%; two of the more severe cases of cerebrospinal syphilis, 0.041-0.048%; tubercular meningitis, 0.026%.

Mestrezat<sup>1</sup> similarly reported low sugar values in the spinal fluids of individuals in whom there existed acute inflammatory processes of the meninges, and this circumstance he explained by assuming that the sugar in such cases is the substrate of the bacterial metabolism. That the values are uniformly high in general paresis, as reported by the same observer, could not be corroborated. Likewise, the figures 0.126-0.212%, obtained by Mott<sup>2</sup> in eight miscellaneous psychopathic cases, mostly dementia precox, in all probability can be ascribed to faulty technique.

The Bang micro-reduction method was at first employed, but owing to the wide fluctuations in the results obtained, it was abandoned for the Lewis-Benedict method, which proved more accurate in the hands of the authors. The fluids were obtained by lumbar puncture of the living subject.

\* Being contributed to the Massachusetts Society for Mental Hygiene, at its annual conference, held at Ford Hall, Boston, June 18, 1915. The first communication of this kind by the H. M. A. has appeared in the *Psychiatric Contribution to the Study of Delinquency*, to appear in *Journal of Criminal Law and Criminology*.



## AN OUTLINE OF THE ELEMENTS AND TREATMENT OF STAMMERING.\*

BY ANNE BRADSTREET STEDMAN, BROOKLINE, MASS.

(From the Out-Patient Department of the Psychopathic Hospital, Boston.)

IT is hardly necessary nowadays to state the general cause of stammering. With the exception of cases of structural defect, stammering is of purely mental origin. Defined, it is the expression in faulty speech of the neurotic temperament. Whether acquired or inherited, it is always there. There are no phlegmatic stammerers.

Therapy, therefore, must be based on this fact. It is the theory of some (Apelt among them) that a cure can be effected only by working from the inside out, that is, by giving all the attention to the frame of mind when speaking. Another method, practised by many teachers who are not physicians, disregards the mental element almost entirely; calls stammering a habit and approaches it through vocal exercises only—from the outside in.

It is true that stammering is largely a habit, and that cases have been found where it still persisted, even after the nervous condition had been eased, simply because the method of speaking, practised through a lifetime, had become mechanical. Also, in the case of children, the growing discouragement and accumulating fears can often be cut short by curing the habit alone.

But neither of these instances is drawn from the majority of cases by any means. Few can be so easily dismissed. The man with an obsession for zigzagging down the street in order to touch every lamppost, does not need lessons in walking through a meadow. He knows as much about walking as his instructor. Just so, the stammerer can produce perfectly normal consonants and vowels *when unembarrassed*. Practical treatment of the habit, vocal exercises, etc., are only half the battle. The treatment must go deeper, until it reaches the fear—the emotional disturbance that occurs under trying circumstances between the thought and its expression.

It is here that the training of a neurologist is required. Comparatively few specialists in speech defect are physicians, while the lay

teachers and so-called professors are legion. And yet stammering is as truly the province of the neurologist as any other nervous affection.

When, therefore, a layman undertakes to treat stammering, the field narrows for him. To reach the mental side of his case, he has to rely solely on the personal touch. He must be the patient's friend. The ideal plan is to go to the patient's home, walk with him; if a child, play with him; and if the patient is in school, interest the teacher of his grade in him. The recitation in school is nearly always the hardest thing a child has to contend with, and unless it is plainly too much for him he has to put up with it for the sake of his standing. But it is the duty of the speech instructor to see just how much strain a child can bear, and, whenever necessary, to get him excused from reciting until, with the treatment he is receiving, the ordeal shall have become less dreadful. Often, to tell a child who is constantly bracing himself for difficulties, that he need not do the things he dreads, is followed by surprise, gradual relaxation and a new perspective, which is a great help to normal speech. In the same way, other obstacles in the daily life of the patient can be surmounted.

In a public clinic this ideal plan is less feasible, and other means have to be found. In order to link the teacher's office (where, after the first, the patient finds himself very much at home) with the outside world, that is full of difficulties for him, the speech class is the next best thing.

Class treatment alone is usually most shallow. In every case it should accompany individual attention. But individual treatment, pure and simple, is apt to be too encouraging. Everything is not overcome, by any means, after the patient has learned to speak perfectly when alone with the teacher, whereas his speech in class is a pretty good indication of his progress at home.

In the speech class there is also the benefit to a reserved, rather lonely patient of contact with others, some of whom are more afflicted than he is himself. He discovers that his difficulties are shared; that, after all, it is possible to treat quite naturally the defect about which he had kept tensely silent all his life.

Then there is the opportunity in a class of this kind of reproducing every-day situations. It is not like a class in school. It is more informal and flexible. Everything is encouraged that tends to put the patient in a normal setting. The routine speech exercises of the teacher's office are here put into practice through storytelling, debate, and games that require conversation. No one joins the class until he is quite willing, and the most shy soon grow to like it.

It is, of course, more difficult to converse naturally in company on interesting subjects than to read or recite before one person, and patients whom the teacher has considered greatly improved frequently do less well when put into

\*Being Contributions of the Massachusetts Commission on Mental Diseases, Whole No. 157 (1916.15). The previous contribution (1916.14, 156) was by J. B. Rieger and H. C. Solomon, entitled "Spinal Fluid Sugar," BOSTON MEDICAL AND SURGICAL JOURNAL, December 7, 1916.



the class. There are also degrees of difficulty in class work. Making a prepared speech or joining in a formal debate is usually the hardest thing for every one. In some cases patients who had been speaking perfectly for months, when called upon to stand up and debate, lost complete control. Such occurrences, instead of being discouraging, are the teacher's opportunity. They show the weak spot in the patient's progress, and improvement from then on, though frequently hard won, is no longer superficial.

As to the elemental speech exercises, on which all such work is based, the methods used are various. They include many principles of singing, elocution, and phoneries, the most practical of which aim to correct a monotone by means of inflexion; rapid, nervous speech, by exercises in slowness; faulty breathing and misuse of speech muscles by training in breath control, relaxation, etc.

Unfortunately, these exercises have all to be overseen by the instructor. A patient cannot work upon them profitably at home. There is little result even when rules are followed quite conscientiously, because the patient is alone at the time, and those who stammer when alone are the rare exceptions. What he can do, and what has to be emphasized continually, is to use the newly acquired speech every day to everyone, just as he does in the clinic. If he does not slip into it easily, he should keep steadily at it until it becomes mechanical; but not every one has the character to do this.

In one sense, of course, the "character" of the patient plays a large part in his recovery. But the word is often misunderstood. Will, perseverance, ambition, are essential in the majority of cases. They make up the final third when a patient has been brought two-thirds of the way towards normal speech. But, as with other nervous cases, the stammerer is sometimes misjudged and thought to "give in" to his infirmity; whereas it is not a "trick" to be overcome by "trying." A change has to be brought about in the patient's attitude of mind; something has to relax, to let go before the force of ambition can even be appealed to. There are weak natures and careless ones, but my observation does not point to any greater lack of character on the part of stammerers than of any other class of people. Character—moral force, that is—is not synonymous with mental makeup, and it is the stammerer's mental makeup, for which he cannot be held responsible, which is at the bottom of his trouble. Cure the habit, but cure the mind as well.

**POSTPONEMENT OF TUBERCULOSIS SUNDAY.**—It is announced that the observance of Tuberculosis Sunday throughout the United States has been postponed from Dec. 3 to Dec. 10. The current week is being observed as "Open Window Week."

## FATTY DEGENERATIVE CHANGES IN THE PURKINJE CELL BELT OF THE CEREBELLUM IN EXHAUSTIVE INFECTIVE PSYCHOSES.\*

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### ABSTRACT.

- I. Purpose of study: To determine, 1. Frequency of fatty change in the cerebellum in toxic condition; 2. Element most affected; 3. Extent of fatty change; 4. Relation to glia cell increase.
- II. Material used included various toxic and exhaustive, or infectious, conditions, controlled by arteriosclerotic and dementia precox material.
- III. Staining methods—Scharlach R. in frozen sections. Cresyl violet in frozen sections.
- IV. Recital of cases: 1. Clinical features; 2. More important post-mortem features; 3. Cellular changes in cerebellum.
- V. Summary of cerebellar cellular changes.
- VI. Discussion of changes: 1. Relation to duration of toxemia; 2. Relation of fatty to glia change; 3. Occurrence in other psychoses.
- VII. Conclusions.

RECENT advances in the physiology of the cerebellum, as reviewed, for example, by Mills and Weisenburg (*Jour. Amer. Med. Assn.*, Nov. 21, 1914), show that the function of this organ (probably represented by the Purkinje cells) is to maintain synergic control of movements. While certain portions seem more concerned with certain complex acts, localization is not sharply defined. The organ probably acts more as a unit than does the cerebrum. Exhaustive infective psychoses, presenting as they do, asynergic symptoms, as tremors, asthenia, atonia, ataxia, seemed to offer a good field for the study of cerebellar changes, and it was suggested that such a study in toxic states of various sorts would be of value in determining: 1, what element of the cerebellum was most affected; 2, the frequency of fatty change; 3, the extent of that change; and 4, its relation to glia cell increase.

The material at hand consisted of six cases autopsied at the Boston State Hospital by Dr. M. M. Canavan, and includes various toxic and exhaustive conditions.

*The Technical Method.* Frozen sections, made from formalin-fixed pieces of cerebellum, were

\* Read in abstract and illustrated at the Third Annual Conference of the Medical and Surgical Work of the Psychopathic Hospital, June 18, 1915. It is a contribution of the Massachusetts Commission on Mental Diseases, Whole No. 159, 1915-17. The previous contribution was by Thomas H. Haines (1914-15, 154), entitled "The Genesis of a Paranoic State," submitted to *Journal of Abnormal Psychology*.



stained with Scharlach R. and counterstained with hematoxylin, giving an intense salmon-red stain to the fat against a blue background. Continuous sections were stained with cresyl violet (Nissl's original stain did not give equally good results with the frozen sections).

CASE 1. Female, single, 66, was admitted Dec. 31, 1910, without a history. She was exhausted and jaundiced. There was a slight fullness over the left thorax. The radial pulse could not be felt. There was marked clouding of consciousness. On attempting to reply to questions her words could not be well made out. She appeared disoriented. She was restless; threw herself about in bed and attempted to get out. She may well have had hallucinations, and screamed at times without apparent cause.

She died Jan. 1, 1911, within a few hours after her admission, and autopsy was performed two hours later. The more important findings were: chronic fibrinous pleuritis, both sides; left hydrothorax with congestion of the left lung; chronic interstitial nephritis; bile capillaries distended, but the duct was patent; a small area of chronic external pachymeningitis over the inferior portion of the left ascending frontal convolution; pia uniformly thickened.

Microscopic examination of the cerebellum showed red staining of many of the small cells in the granule layer and of a large proportion of the small cells in the ganglionic area. Of the ganglion cells, about one-half were markedly affected, nearly all to some extent. The nucleus of many of the ganglion cells was distorted and dislocated, and with the cresyl violet stain tigroid bodies were found to be absent from a larger or smaller portion of the cell. There was little, if any, increase in glia cells.

CASE 2. Male, 39, single, was admitted Feb. 7, 1911, and died within twelve hours. Aside from his having been markedly alcoholic, nothing was ascertained as to his past. Respiration was difficult, and there was evidence of consolidation of the right lower lobe. His pupils were equally dilated, but the neurological examination, as far as it could be made, was otherwise negative.

He was disoriented and so confused as to be unable to give information. He was apprehensive, evidently as a result of hallucinations, and he spoke at one time of seeing rats.

Autopsy was performed 34 hours post mortem. There was found a right lower lobe pneumonia with an accompanying pleuritis. There was some sclerosis of the aorta and of the coronaries; the heart was large, weighing 535 grams. The liver was large and fatty; kidneys showed a chronic interstitial nephritis with an acute degeneration. There was considerable subpleural edema.

Microscopic examination showed a few red-stained small cells in the white matter of the cerebellum. Only an occasional cell in the granule layer was affected, but many of the small cells in the ganglionic zone. Of the Purkinje cells, about two-thirds were markedly involved.

In many nearly the whole cell was filled with granules, the nucleus being to one side, the cell misshapen, and with the cell stain, showed marked lack of tigroid bodies and the nucleus often staining quite indistinctly. There appeared to be little neuroglia increase.

CASE 3. A female, 53, married, was admitted May 9, 1911, with a history of having used alcohol moderately. Two weeks before admission, while getting dinner, she sat down, and it was noticed that she could not articulate well. The right side of her face was said to have been drawn down. She complained of a slight headache. When examined, her pupils were irregular, but reacted. There was only slight motion in the right side of the face, the upper part being involved as well as the lower, and the tongue deviated to the right on protrusion. The heart was enlarged to the left. There was no paresis of the extremities and the reflexes were normal. Urine sp. gr., 1035, and contained sugar. She appeared to be disoriented, but to what extent could not be well made out on account of her difficulty in articulating.

During her stay she had convulsive attacks, not accompanied by loss of consciousness, which involved only the right side of the face, the tongue and neck muscles. These clonic spasms lasted from 10 to 20 seconds, and at times occurred as frequently as every one-half to two minutes. She developed a left broncho-pneumonia with slight temperature, and died May 11, two days after admission.

Autopsy a few hours post mortem. More important findings: Hypertrophy of heart with fatty degeneration; fatty degeneration of kidneys; subpleural edema with atrophy of the convolutions in the frontal, pre- and post-central regions; irregular sclerosis of the basal vessels.

In the cerebellum the endothelial cells of the capillaries were more markedly involved than in the preceding cases, the red granules being larger. Two-thirds of the Purkinje cells had marked deposits of granules, and very few were not involved to some extent. In this zone the affected small cells formed an almost uninterrupted layer. With the cellular stain, disintegration of the tigroid bodies appeared quite marked. There was some increase in neuroglia cells in the Purkinje layer.

CASE 4. Female, single, 60 years of age. She had always been peculiar and irritable, was inferior mentally and had had a number of illegitimate children. In 1911, one year before admission, she began to fail physically, and examination by a physician showed that she had well advanced pulmonary tuberculosis. At about the same time she developed ideas of hypnotism and of influence.

On admission, Feb. 9, 1912, she was in a much weakened condition, and examination showed a marked involvement of both upper lobes. She was irritable and fault-finding, thought every one was against her, that she was being hypnotized and influenced. Her ideas do not appear to have been at all well worked out. She was oriented and memory seemed good.

She had a temperature from the time of her ad-



mission, often going to 102 or 103 in the evening.

She had attacks of diarrhea. Two days before her death, on Oct. 6, 1912, she developed a left femoral thrombo-phlebitis. She became dyspneic and moist râles were heard throughout the lungs.

Autopsy 3 hours post mortem disclosed advanced pulmonary tuberculosis; tubercles in the liver and spleen; tubercular ulcers in the ileum and colon; thrombosis of left iliac vein. Pia only slightly thickened; nothing else of note in the brain.

**Microscopic examination:** The cerebellum showed a moderate degree of change, confined mostly to near the ganglionic zone. About one-third of the Purkinje cells showed fat, but the deposit was nowhere very marked. Not many of the cells had nuclei dislocated, and with cresyl violet few showed internal disarrangement. There was some increase in glia in the ganglionic area.

**CASE 5.** A female, 42, divorced. Her father and mother were both alcoholic. In 1911, two years before admission, she had an operation for carcinoma of the uterus, and a year later began suffering from symptoms of an extension of the growth, pain, incontinence of urine, etc. About this time she began to hear voices, thought people were watching her, and that her food was poisoned. She reacted to these ideas.

When admitted, July 1, 1913, she was poorly nourished, but aside from evidence of extension of the carcinoma to the vesico-vaginal septum, there was nothing of importance found physically. She heard people outside cursing and saying that she was immoral. They were digging her grave. She was apprehensive and yelled out of the window at her tormentors. A little later the nurses seemed to talk among themselves about her and do other things to annoy her. She was oriented. She grew weaker, had vaginal hemorrhages, and died July 27, 1913.

Autopsy performed 3 hours post mortem showed a hydronephrosis from obstruction of the vesical orifice of the ureter by the carcinomatous growth. The pia was not thickened, and there was no sclerosis of the cerebral vessels. The brain substance was of a decreased consistency in both parietal regions.

The cerebellum showed considerable change in the capillaries, the red granules often being large. There was a fairly marked involvement in the granule layer and of the small and ganglionic cells in the Purkinje layer, about one-half of the latter being markedly affected. Considerable derangement of the internal structure of the ganglion cells and an increase in glia cells in this region was noted.

**CASE 6.** A male, single, 57 years of age, was supposed to have had a pulmonary trouble for some time, but for only a few weeks had been acting peculiarly. He was restless and irritable, tearing up his bedding at night without giving any reason for doing so. He was said to be untidy and resistful.

On admission, Feb. 7, 1914, he was very weak and poorly nourished. He was scarcely able to talk in a whisper, and had a cough. He had a

right scoliosis and a lordosis. There was dulness over both apices. He had a low, irregular temperature. Tubercle bacilli were never found in the sputum. He refused to coöperate, and when questioned would cover his head and refuse to explain himself. He seemed to be poorly oriented, but sense falsifications and delusions, while probably present, could not be brought out. He died March 13, 1914.

Autopsy, 46 hours post mortem. Carcinoma of upper and lower thirds of esophagus. Nodules over surface and peribronchial infiltration of right lung. Pia slightly thickened; amount of cerebrospinal fluid large.

The capillaries in the cerebellum were involved to very limited extent, and the changes were not very marked anywhere. In the ganglionic zone many of the small cells and about one-fifth of the Purkinje cells showed red granules. Many of the ganglion cells, stained poorly with cresyl violet, were misshapen and had the nucleus to one side. There was an increase of glia cells in the outer portion of the granule layer and in the ganglionic area.

These cases seem to possess sufficient clinical features to warrant including them in the exhaustive-infective group. Cases 1 and 2 are acute deliria; 3 diabetes with cerebral symptoms; 4, 5, and 6 are cases of longer duration in which the physical condition seems to bear a direct causative relation to the mental symptoms.

The changes found in the cerebellum may be summarized as follows:

1. *Capillaries.* A varying number of endothelial cells showed fine red granules, usually filling the whole cell. At times several adjoining cells were affected. The changes in the capillaries were confined largely to the granule layer and especially to the vicinity of the Purkinje cell belt, but a few of the vessels in the white, and also a few in the molecular, layer and in the pia showed affected cells in small number.

2. *White Matter.* An occasional cell, especially near the granule layer, showed red staining.

3. *Granule Layer.* A good many cells showed fine red granules surrounding the nucleus, the larger cells seeming to be especially affected. Changes were more marked toward the ganglionic zone.

4. *Ganglionic Zone.* Many of the small cells in this area (glia cells) showed red granules thickly set in the protoplasm, in some cases nearly all the cells being affected. The number of Purkinje cells affected in different cases varies from few to nearly all. Fine, intensely red granules were thickly set in the protoplasm, the collection being supra-nuclear or to the side when the nucleus was dislocated, as was often the case.

The infra-nuclear portion was seldom involved unless the whole cell was. With the cresyl violet stain, the Purkinje cells showed poor staining of the tigroid bodies correspond-



ing to the area stained red with Scharlach R. Also a varying amount of distortion of the cell body and nucleus was present.

Glia increase, especially in the Purkinje cell belt, was more or less apparent in chronic cases, these cells often showing fatty change.

5. *Molecular Layer* showed no fatty deposit, as a rule.

It is seen, then, that cell degeneration and fatty deposit is confined quite closely to the Purkinje cell belt, involving the capillaries and small cells, as well as the ganglion cells, especially in this region. In Cases 1, 2 and 3 (acute), the fat deposit involved a larger proportion of Purkinje and other cells, and the individual cells were affected to a more marked degree than was the case in Cases 4, 5, and 6 (chronic). In the more acute cases there was considerable internal disarrangement of the cell-structure, poorly stained areas in the chromatin, dislocation of the nucleus, but little, if any, glia increase. In the more chronic cases there were more shrunken and distorted cells, and there seemed to be an increase in glia cells that corresponded in a general way with the degree of Purkinje cell destruction. In Case 4 destruction was not marked, neither was the glia increased, while in Cases 5 and 6 both were quite advanced. The acute cases, then, showed in the Purkinje cell belt:

1. Marked fatty deposit.
2. Acute cellular changes.
3. No glia increase.

The chronic cases showed:

1. Less marked fat deposit.
2. Cellular change of a more chronic type, as shrinking, distortion, and complete destruction.
3. Glia cell increase, corresponding to the Purkinje cell destruction.

Of other cases examined, two, clearly of arteriosclerotic variety, but complicated by carcinoma, showed fatty changes in the cerebellum corresponding in every way with those described, but of less degree. The cellular destruction was quite marked in these two cases, as was the glia proliferation in one of them. In two precox cases there was no fat deposit in the cerebellum. In one case of Korsakoff's psychosis, fatty change in the cerebellum was confined to a few capillaries. A senile case showed changes similar to the arteriosclerotic cases. Two paretics showed no fat in the cerebellum.

So far as our investigation has extended we have found that:

1. Fatty changes of a type described in detail above occur in the cerebellum, especially in the Purkinje cell belt, in conditions which interfere with the nutrition of the brain, as arteriosclerotic brain disease, senile dementia, and in exhaustive infective psychoses.

2. The fatty changes are more marked in the toxic group than in others that we have examined.

3. The more acute the process, the more marked is the fat deposit.

4. In chronic cases the fat deposit may not be large, but as cell destruction advances, the number of glia cells increases.

5. This study demonstrates in a new way the great lability of the Purkinje cell region, of which there has been increasing evidence from other methods of investigation for many years past.

## THE YERKES-BRIDGES POINT SCALE; AS APPLIED TO CANDIDATES FOR EMPLOYMENT AT THE PSYCHOPATH- IC HOSPITAL.\*

By C. S. ROSSY, BOSTON.

*Intern in Psychology, Psychopathic Hospital.*

At the suggestion of Dr. Herman M. Adler, chief-of-staff, the Psychopathic Hospital has adopted the method of submitting to psychological examination every candidate for employment as clerk or attendant. It is the object of this paper to present the results obtained from the examination of the first sixty candidates.

*Candidates.* The candidates, both male and female, were referred to the Hospital by different employment agencies of Boston, with a few exceptions. The majority of them had attended grammar school, only 28% having advanced to the high school. Their ages varied from eighteen to fifty-five, the average age being twenty-five.

*Method.* After the candidate had applied for work to the superintendent of nurses, and his references had been verified, he was asked to report for a psychological examination. This examination consisted principally of the Yerkes-Bridges point scale, with the multiple choice,<sup>†</sup> and a few other supplementary tests given at the discretion of the examiner.

The point scale, devised in 1914 by Robert M. Yerkes and James W. Bridges, is a method for determining the degree of intellectual development. It comprises twenty tests, to each of which a certain credit is allotted. The subject is graded according to his reactions, with full, partial, or no credit; when the examination is completed, the sum total of these credits indicates his mental grading in percentage.

\* Read in abstract at the Third Annual Conference on the Medical and Social Work of the Psychopathic Hospital, June 18, 1915. Being Contributions of the Mass. Commission on Mental Diseases, Whole No. 160, 1915:18. The previous contribution was No. 159 (1914:17), by Egbert W. Fell, entitled "Fatty Degenerative Changes in the Purkinje Cell Belt in Exhaustive Infective Psychoses." BOSTON MEDICAL AND SURGICAL JOURNAL, December 7, 1916.

† A method devised by R. M. Yerkes for comparative study of individual reactions of human and infra-human subjects.



**Results.** From February to June, 1915, sixty candidates were examined. With the exception of two, who applied for position as clerk, all of the applicants solicited work as attendants. The following table shows the classification of these candidates according to their degree of intelligence:

TABLE I.  
CLASSIFICATION OF CANDIDATES ACCORDING TO  
MENTALITY.

Normal .....	63%
Slightly subnormal .....	17%
Intellectually inferior .....	20%

In the normal group, which includes only 63% of the whole, are found all applicants who obtained a score above 82 points, that is, who graded above the standard for the mentality of 15 years. (See "A Point Scale for Measuring Mental Ability," page 67.) Of these presumably normal candidates,

25 obtained .....	82-90 points
9 " .....	91-95 "
4 " .....	96-98 "

In the second group (17% of the whole), comprising candidates of slightly subnormal intelligence, are included those applicants who obtained between 76 and 82 points credit.

In the third group, we find 20% of the candidates. These graded below 76 points, and their reactions indicated intellectual inferiority. According to the norms of the point scale (see "A Point Scale for Measuring Mental Ability," page 67), these subjects did not attain a mental rating equal to that established for the intelligence of a 12-year-old child, namely, 77 points. Of the subjects included here,

7 obtained .....	60-69 points
5 " .....	70-75 "

It is noticeable that a history of alcoholism, immorality, or delinquency was obtained from many of these individuals.

The following charts represent, respectively, the distribution of mental grading and the distribution of education received by the applicants examined.

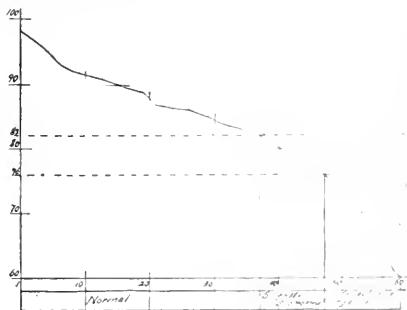


CHART I.  
DISTRIBUTION CURVE REPRESENTING GRADING OF 60 CANDIDATES  
FOR EMPLOYMENT.  
Ordinates—points scored; Abscissae—number of subjects.

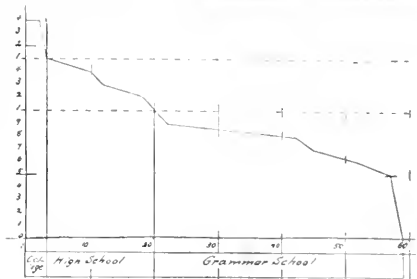


CHART II.  
DISTRIBUTION CURVE REPRESENTING EDUCATION OF 60 CANDIDATES  
FOR EMPLOYMENT.  
Ordinates—school years; Abscissae—number of subjects.

Table II has been arranged to illustrate the variation in the responses of the sixty subjects to one of the twenty tests of the point scale, namely, Test 13, in which the subject is required to name as many words as possible in three minutes.

TABLE II.  
RATE OF FREE ASSOCIATIONS.

NO. OF WORDS	NO. OF SUBJECTS
20-29 .....	3
30-39 .....	3
40-49 .....	1
50-59 .....	6
60-69 .....	7
70-79 .....	11
80-89 .....	10
90-99 .....	6
100-126 .....	7

From the above table we obtain the following results:

Mode .....	70-79
Median .....	70-79

The exact median proves to be 75 words, which coincides with the minimum requirement for a normal adult. The lowest number of words said by any subject was 21, the highest number, 126. It is interesting, also, to note that 26.6% of the subjects fail to meet the Binet-Simon requirement for the twelve-year-old mentality.

The following table presents the individual record of each candidate.

TABLE III.  
RECORD OF SUBJECTS TESTED.

SUBJECT	AGE	SEX	EDUCATION	MENTAL AGE	MENTAL GRADE
A	M	35	80	College grad	Slightly subnormal*
B	M	29	96	High sch 2	Normal
C	M	21	90	Gram sch 8	Normal
100	F	20	89	High sch grad	Normal
101	M	29	72	Gram sch 6	Intellectually inferior
102	M	28	98	Gram. sch 8	Normal

\* 112 words obtained from the test.



TABLE III.—continued  
RECORD OF SUBJECTS TESTED.

SUBJECT	SEX	AGE	POINT SCALE SCORE	EDUCATION	CLASSIFICATION
103	M	34	69	Gram. sch. 8	Intellectually inferior
104	M	26	79	Gram. sch. 7	Slightly subnormal
105	M	26	81	Gram. sch. 8	Slightly subnormal
106	M	27	83	Gram. sch. 8	Normal
107	M	24	93	High sch. grad.	Normal
108	M	28	75	Gram. sch. 3	Intellectually inferior.
109	M	34	96	Gram. sch. 8	Normal
110	M	34	81	Gram. sch. 5	Slightly subnormal
111	M	25	89	Gram. sch. 9	Normal
112	M	24	89	Gram. sch. 8	Normal
113	M	35	91	Gram. sch. 8	Normal
114	F	23	85	High sch. 3	Normal
115	M	27	96	Gram. sch. 8	Normal
116	F	23	82	Gram. sch. 8	Normal
117	M	26	85	Gram. sch. 8	Normal
118	M	26	92	College grad.	Normal
121	M	18	89	High sch. 2	Normal
122	M	21	76	Gram. sch. 8	Slightly subnormal
124	F	28	87	High sch. 4	Normal
125	M	40	83	High sch. grad.	Normal
126	M	19	91	High sch. 3	Normal
127	M	26	78	Gram. sch. 9	Slightly subnormal
128	M	30	86	Gram. sch. 6	Normal
129	M	34	86	High sch. grad.	Normal
130	M	22	82	College 1	Normal
131	M	23	72	Gram. sch. 5	Intellectually inferior
132	F	23	79	Gram. sch. 8	Slightly subnormal
134	M	55	69	Gram. sch. 5	Intellectually inferior
135	M	31	66	Gram. sch. 6	Intellectually inferior
136	M	21	93	High sch. 1	Normal
137	M	23	61	Gram. sch. 7	Intellectually inferior
138	M	20	78	Gram. sch. 5	Slightly subnormal
139	M	23	83	High sch. 2	Normal
140	F	35	84	Gram. sch. 8	Normal
141	M	24	90	Gram. sch. 8	Normal
142	F	22	95	High sch. 1	Normal
143	F	22	67	Gram. sch. 2	Intellectually inferior
144	M	37	90	High sch. 2	Normal
145	M	30	91	High sch. grad.	Normal
146	F	22	60	Gram. sch. 6	Intellectually inferior
147	M	24	86	Gram. sch. 6	Normal
148	M	35	85	Gram. sch. 8	Normal
149	M	29	84	High sch. 2	Normal
150	M	23	82	High sch. 2	Normal
151	M	27	86	High sch. grad.	Normal
152	M	32	91	Gram. sch. 6	Normal
153	M	24	86	Gram. sch. 8	Normal
154	M	22	76	Gram. sch. 8	Slightly subnormal
155	M	38	65	Illiterate	Intellectually inferior
156	M	25	71	Gram. sch. 7	Intellectually inferior
157	M	22	92	Gram. sch. 8	Normal
158	M	21	77	Gram. sch. 6	Slightly subnormal
159	M	29	73	Gram. sch. 5	Intellectually inferior
160	F	23	88	Gram. sch. 8	Normal

#### CONCLUSIONS.

The following conclusions are drawn from the results presented in this paper:

1. A high percentage of defective and other-

wise mentally incompetent individuals is found among candidates seeking employment as attendants in state hospitals.

2. It is desirable that each candidate for employment should be submitted to a systematic psychological examination for estimating his general intelligence.

3. These results, though preliminary, empirically indicate that the federal and state civil services might well consider the plan of using reliable intelligence tests in their routine examinations.

#### REFERENCE.

- <sup>1</sup> Yerkes, R. M., Bridges, J. W., Hardwick, R. S.: *A Point Scale for Measuring Mental Ability*, Baltimore: Warwick and York, 1915.

### THE INTENSIVE GROUP OF SOCIAL SERVICE CASES.\*

By MARY C. JARRETT, BOSTON,

*Chief of Social Service, Psychopathic Hospital.*

WHEN the Social Service in this hospital was begun, two years ago, one year after the hospital opened, our first report was an orientation study of our function; next an estimate was attempted of the amount of social work there would be; and this was followed by further notes on the nature and size of our problem, with an estimate of the number of social workers who would be needed.† This year is evidently the time for a report on what we have done.

The nucleus of all our work is the intensive group of cases, and this report will go into detail in regard to them only.

By intensive, we mean those cases in which the Social Service Department has assumed responsibility for making an inquiry into the social condition of the patient and his family, and for taking steps to secure the greatest measure of social well-being possible for them.

\* Read at Third Annual Conference on the Medical and Social Work of the Psychopathic Hospital, June 18, 1915. Being Contributions of the Massachusetts Commission on Mental Diseases, Whole No. 161 (1916.19). The previous contribution, 160, 1916.18, was by C. S. Rossy, entitled "The Yerkes-Bridges Point Scale; as Applied to Candidates for Employment at the Psychopathic Hospital," BOSTON MEDICAL AND SURGICAL JOURNAL, Dec. 7, 1916.

† Officers of the Psychopathic Hospital, medical and social, have published the following articles on social service and allied subjects:

- (1914.4) E. E. Southard. Feeble-mindedness as a Leading Social Problem.  
(1914.5) Mary C. Jarrett. The Function of the Social Service of the Psychopathic Hospital.  
(1914.19) A. Warren Stearns. The After-Care Program and Results of the Psychopathic Hospital.  
(1913.33) A. Warren Stearns. Notes on After-Care and Moral Supervision Work with Alcoholics in the Out-Patient Department of the Psychopathic Hospital.  
(1913.7) Mary C. Jarrett. Statistical Notes on the Need of Social Service in the Psychopathic Out-Patient Department.  
(1914.20) Mary C. Jarrett. Further Notes on the Economic Side of the Psychopathic Social Service.  
(1915.) Helen M. Wright. Examination and Prophylaxis for Syphilitic Patients and Their Families: Methods of Investigation at the Psychopathic Hospital, Boston, Mass., 1915.



In another group, known as Slight Service cases, the assistance given by the Social Service does not involve an inquiry into the patient's general situation beyond the apparent facts, nor responsibility beyond the particular service rendered. These two divisions of social ease work now seem to be generally recognized in most hospital social service departments.

In our two years' existence we have dealt with 440 cases in the intensive group, of which 68 are still under care. It happens that 440 is somewhat above the number of cases which, according to our estimate two years ago, two social workers would expect to deal with in two years. The hospital has only two social workers on the pay-roll of the State; but the help of students and other volunteers and several privately paid workers has made it possible to develop, in addition, several other lines of work—1238 cases have been dealt with in the slight service group; a Men's Club for discharged alcoholic patients has met once a month; a routine system of following up all out-patients who fail to report when due has been in operation a year and a half. Two pieces of work have been undertaken with the combined ideas of treatment and research,—first, a study of opportunities for psychopathic patients in industry; and second, a routine method of securing examination of the families of all syphilitic patients.†

The 440 intensive cases included 186 men, 185 women, and 69 minors. The following types of mental disorder and defect were represented:

Alcoholic .....	74
Backward .....	2
Delinquent .....	16
Drug habit .....	3
Epilepsy .....	16
Feeble-mindedness .....	35
Hysteria .....	10
Insanity .....	147
Neurasthenia .....	10
Not insane .....	47
Psychoneurosis .....	22
Psychopathic personality .....	7
Syphilis .....	18
Unclassified .....	14
All other diagnoses .....	18
Not made .....	1

The largest group were the insane, 36%+.

17% were alcoholic.

11%+ were psychoneurotic.

8% were feeble-minded.

3% were epileptic.

10%+ were diagnosed as not insane.

The remaining 14%, covering all other diagnoses, included syphilis, drug habit, delinquency, etc.

The different types of action taken may be classified as follows:

In 139 cases advice was given.

In 124 cases history needed by the doctors to make a diagnosis was obtained.

In 101 cases the patient was kept under supervision.

† Examination and Prophylaxis for Syphilitic Patients and Their Families: Methods of Investigation at the Psychopathic Hospital, by Helen M. Wright, Boston, Mass., 1915.

In 39 cases the patient was referred to another agency.

In 23 cases arrangements for the patient's discharge were made.

In 14 cases other members of the family were brought under care.§

By giving advice, we mean outlining a plan and, if necessary, assisting the patient or his family to follow it. An illustration of this class is the case of a backward child of eight in a family that contains four other defectives. The little girl is to be sent to the country for the summer. She is the original patient, but we now have the epileptic father as an out-patient. We keep general oversight of a feeble-minded son who is working, and we expect to persuade the father to make application to the School for the Feeble-Minded for a daughter of fourteen. A younger son is under observation in the out-patient department, and the over-burdened mother, by our advice, comes there also for reassurance in regard to her own mental condition.

An example of history necessary for the diagnosis is the case of a woman of thirty, daughter of a rag-picker, who had been supporting himself and her and his blind wife by begging, with the story of his daughter's broken-down health.

She was at first thought to be hysterical and was about to be returned to her father, but the history showed marked deterioration, and she was committed to a state hospital with the diagnosis of dementia precox.

Arrangements made for a patient's discharge may be illustrated by the case of an Irish servant girl, sent here for observation because she refused to eat or speak. She was pregnant and subnormal in intelligence. After investigation it was decided to secure her admission to a maternity home. The baby died and the girl is doing well in a position under the oversight of the Home.

An example of a case referred to another agency is a girl of fifteen, who had run away from home disguised as a boy. She was uncontrollable at home, and her parents were on the point of sending her to a reformatory. She was diagnosed as not insane and not defective. Under the care of the Children's Aid Society she has remained at home, worked regularly and attended night school, and is much improved.

To illustrate prophylaxis for other members of the family, the case may be given of a man with general paresis, whose wife and four children were brought in for examination. One child, a nervous, high-tempered boy, was put under treatment for syphilis.

The class of supervision cases have been left until last because they are the most intensive part of the group, and I want to speak of them in some detail. By supervision, we mean continuous oversight of a patient over a considerable period, from three or four months, to an indefinite time.

For example, a girl of sixteen, who was ad

§ See Appendix for illustrative cases.



mitted to the House two years ago twice in one month, with hysterical convulsions, is still under supervision. She has been educated in the control of herself, and has been helped financially so that she could study dressmaking. She has had several convulsions, but they have been much less severe and at longer intervals; and, in general, she is now in good health and good spirits.

The number of supervision cases dealt with was 101,—48 men, 41 women, and 12 children; 88 were at one time house-patients and 12 were out-patients only.

59 have improved.

42 have not improved.

18 were readmitted to the hospital and again discharged.

11 were committed to a state hospital.

3 went to reformatories.

1 went to an almshouse.

Of the 59 improved patients, 7 were re-admitted to the House and discharged after a short period. In 22 cases other members of the family needed assistance. For example, in the case of the hysterical girl just referred to, the father, who is alcoholic, has been made to report to the Out-Patient Department, and is somewhat improved. The purpose of our supervision may be classed as *after-care* in 37 cases, that is, no marked improvement in the patient's mental condition could not be expected; and as *prevention* in 64 cases, in which, under favorable environmental conditions, the patient might be expected to recover or to show marked improvement.

Some conclusions drawn from the study of 101 supervision cases are as follows:

1. The value of temporary residence in the Hospital as a therapeutic measure in some cases, shown in 7 of the 59 improved cases.

2. The possibility of a greater proportion of improvement than the 58% shown in this group through more careful selection of cases, since it is possible with a limited staff to care only for selected cases.

3. More attention to out-patients in the earlier stages of mental difficulties, with a view to prevention. It is probable that in our supervision work, there should be a smaller proportion of after-care than is indicated by the 37 cases in this group, compared with 64 cases for prevention.

4. A routine examination of every patient to determine his need of social care, to be held in view as an object when funds become available for a larger staff.

A beginning has been made in tabulating the social interests involved in psychopathic social service cases, following the division outlined by Roscoe Pound in his articles on "Interests of Personality," published in the *Harvard Law Review*, February and March, 1915, as an advance chapter of his projected book, "Sociological Jurisprudence." He distinguishes three

classes of rights or interests of the individual in relation to the environment,—individual, social and public. The study that we are making will be reported upon later in detail, and one conclusion only seems interesting to be mentioned now. Among the 440 cases studied, individual interests are involved to a greater extent than either of the other two classes, 647 times; social interests come next and are involved 544 times; while public interests are involved 409 times. The indication, therefore, is that the concern of psychopathic social service is primarily with the care of the individual; next, with the welfare of society, and finally, with the public good as represented in public institutions.

## APPENDIX.

### ILLUSTRATIVE CASES.

#### GROUP I. CASES IN WHICH THE PATIENT WAS KEPT UNDER SUPERVISION.

CASE 1. Bessie E., a girl of nineteen, was referred to the Social Service for supervision when discharged from this hospital about a year and a half ago. Her diagnosis was hysteria, with a question of dementia precox. She believed that her face was so ugly and "silly" that nobody could bear to look at her, so she would sit shrinking into a corner with her head turned against her shoulder, twitching and wriggling. She spoke only in a whisper, haltingly, and with a great effort. She was unfit for any ordinary occupation and very unhappy.

Her family consists of the mother, who has had two attacks of manic-depressive insanity, an excitable sister who works as a bookkeeper, a brother in school, and the mother's mother, 75 years old. The mother and sister were over-solicitous about Bessie and worried her by fussing over her. It was arranged that she should live with an aunt near the hospital and attend a cooking class and a gymnasium class at a neighborhood house. She also came to the hospital regularly for knitting lessons. In the beginning it took her a full minute or more to make one stitch. She improved and was happier. In the spring she was sent to a convalescent home in the country where her sister paid her board, and she gained noticeably in self-control while there. Arrangements were then made for her to board in a small working girls' home and work secured for her at a playground to play with the children, for which she was paid through a special donation. It is now planned to send her for two months to a girls' camp, under the management of a woman physician, money for her expenses having been raised by private subscription. She has shown marked improvement, and our hope is to continue to provide a thoroughly favorable environment until she has either recovered from her acute symptoms, or has shown a decided form of mental disease.

CASE 2. Harriet Q., aged 55, heard the big clock on her mantel talk to her in a vindictive manner. She had twice in two months become so violently enraged by it, that her husband had had to send her to the Psychopathic Hospital. When the time came for her second discharge, an effort was made to alter her home life, so that she would not be alone and unemployed as much as she had pre-



viously been. She took daily exercise out of doors, and through the coöperation of her relatives was visited, and kept busy. She reported regularly to the Out-Patient Department every two weeks and was no longer troubled by the clock. Her diagnosis was senile dementia.

**CASE 3.** James R.; was ready to be discharged, with a diagnosis of locomotor ataxia. He had been sent here because he had suicidal tendencies. He had been a teamster, and lived, with his wife, in the family of a married step-daughter, who has three children. We persuaded him to go to the State Infirmary because the doctors advised his having hospital care. After six weeks he went home because he was homesick. He spoke no English and could not make friends. The support of the patient was a problem, as the son-in-law was already over-burdened. The Overseers of the Poor were applied to, and gave \$2.00 a week. Arrangements were made with the district doctor to supervise the patient, and when, in two months, he had one of his attacks, the doctor sent him to the City Hospital, where he stayed two weeks. Recurring attacks of intense pain, with suicidal ideas, are to be expected. Attempts to secure some light employment for him resulted in a course in chair-caning at the Industrial School for Crippled Children. He did some work there until the school closed in the summer, and then a position was found for him in a factory, where, though the conditions were as favorable as possible, the strain was too much for him. He is very helpful in work about the house, and is now making a grind-stone with which he hopes to get work sharpening knives.

The weekly visit to the family has reassured them in regard to their fear of suicide, and has also been the occasion for some practical help and advice. The custom of keeping bantam hens in the house was eliminated, and later a family of kittens disappeared after comment from the visitor. A bed was supplied for two of the children who had been sleeping with the patient and his wife.

The Board of Health found the family over-crowded and told them to move. This trial was averted, as the agent of the Board was persuaded to remeasure the tenement, and discovered that it was his mistake. As the family were obliged to eke out their expenses by having two boarders in one of their rooms, they were more crowded than they should be, and we were hoping to do away with the boarders by securing more financial aid for the family, when the daughter decided to move to another tenement with her family. She needs an operation badly, which we hope to persuade her to have, after the baby recovers from an attack of dysentery, which she had this summer. She had been left weak and thin, and is still under the care of the district doctor and nurse. A vacation in the country was secured for her and two of the children during the hottest weather.

**CASE 4.** John O., a tailor, aged 39 (diagnosis, dementia precox, catatonic), had a wife and two children to support. His former employer, for whom he had worked thirteen years, was afraid of him when he returned from the hospital, and was quite satisfied with a younger man who was doing the patient's work for less money. Work had been scarce, and there seemed to be no place for a tailor who had once been called insane. Several visits

from the agent were made to the former employer before he could be convinced that the patient was now in condition to return to his work. He did, however, take him back and has allowed him a half day monthly to report at the Out-Patient Department of the Hospital.

**CASE 5.** Charles O., 17 years old, was before the court in a nearby town for setting fires. He had set three different fires within three months, each time playing the hero by discovering the blaze and helping to put it out. He was otherwise a good boy, mechanically inclined, but poor in school work. Before committing him to a reformatory, the court sent him to the Out-Patient Department for a psychological examination. In this he ranked above the normal, but showed a tendency to react too quickly, making conclusions before he had considered the whole situation. The court was advised to put him on probation and, as he had won general disfavor in his home town, to send him to Boston, to be under supervision of the hospital Social Service. He secured good lodgings where he would have the companionship of young men of his own age and temporary work, which would give him a chance to show what he could do. He gained the friendship of his employer, and appeared to be making good, when without warning of any mental disturbance, he set a fire in the building where he lived, and was again the hero of the occasion. As he had not improved in an environment thoroughly favorable, the court decided to treat him as a defective. After a period of observation in a state hospital, he was committed to a school for the feeble-minded.

**CASE 6.** John L., aged 39, a man of agreeable manners and appearance, educated in Ireland, where he nearly completed a medical course, is now employed by a large drug firm, who say he is extremely valuable to them.

He has been married six years and has two children. Two and a half years ago he came to the United States, and a year and a half later, brought his family. At intervals since his marriage he had had spells of drinking, when he was violent and abusive. During an attack, which lasted seven months, he required the care of male nurses.

He was brought into the hospital by the police because he had been abusive to his wife, threatened to choke her, and had thought people in adjoining apartments were talking about him. After two weeks he had recovered his mental powers. His employer, on the strength of assurances from the hospital, gave him back his position. Communication was established with his wife, who was seen at intervals at their home and at the hospital. She is an intelligent woman and realizes that there is danger of her husband's doing harm to her and the children when he is drinking. As he is without relatives or friends in this country, she has been especially grateful for the moral support of the social worker.

In June she came for advice, saying that her patient was acting strangely and had been drinking a little. She was told to have the police bring him into the hospital again at the first sign of violence. Two weeks later she sent a messenger to advise that the patient was drinking heavily and had threatened her. She was called in to see him in the police station, it was necessary. We then arranged for the police to bring him to the hospital. He cleared up an



ten days, again returned to his position, and has been in good condition since.

#### GROUP II. CASES IN WHICH ADVICE WAS GIVEN.

CASE 1. Arthur R., an Italian, 34, became violent at home, and through this hospital was committed to a state hospital, with the diagnosis of dementia precox. His wife and two children, aged  $5\frac{1}{2}$  and 4 years, were given lodgings with a relative who could afford the room, but had little means with which to provide food and clothing. The wife was restless, and worried constantly about her own dependence and her husband's illness. Work was, therefore, found for her in a candy factory, where she earned good wages as a chocolate dipper. The children were admitted to a Day Nursery in order to relieve the relatives of their noise and the quarreling between them and her own children. Subsequent visits found the wife happy in being able to contribute toward her own support, and the relations between the relative and the family were unstrained.

CASE 2. Benlah V., a quiet, refined woman, unmarried, was sent to the Psychopathic Hospital as a voluntary patient through a social agency, in the hope that a diagnosis might aid them in making future plans for her. It had seemed impossible to find her any work that she liked or would keep.

After a few days in the hospital, she decided not to remain, but was persuaded to stay as long as the doctors advised. After observation for nearly a month a temporary diagnosis of psychoneurosis was made, with the question of a possibility of early dementia precox. She returned to the social agency, tried several kinds of work, but finally gave up trying and went to live with an aunt. After a few weeks she refused to eat with the family, shut herself in her room alone, became suspicious of her aunt, and would not talk. The aunt, an intelligent woman, was instructed how to deal with the patient. She is keeping a diary of her conduct and changing moods, and in case she becomes unmanageable, will notify us, so that, if necessary, she can be brought back to the hospital.

CASE 3. Edward L., a feeble-minded boy of 15, was a great care to his mother, a woman of refinement, who had to support him and another child, a bright girl of ten years. Edward was masturbating badly, and had become so uncontrollable at times that he would beat his head against the wall and act more like an animal than a boy. A special effort was made to have him admitted to the already crowded school for the feeble-minded, and within three months the patient was having the care and training that he needed.

CASE 4. Anna L., a girl of 17, with a diagnosis of imbecility, came to the Out-Patient Department with her mother, who asked for help in getting her into the School for the Feeble-Minded, as she could not manage her. Over a year before, an application had been filed. We found that the girl could be received at Wrentham, and then the mother refused to sign the commitment paper. The father was sick in a hospital, the mother was too sick to be summoned into court, and the neighbors were supplying food and fuel. The Jewish Charities promised aid. After repeated efforts for two months,

during which the mother changed her mind many times, she was persuaded to sign the commitment paper, and the girl was sent to Wrentham.

#### GROUP III. CASES IN WHICH THE PATIENT WAS REFERRED TO ANOTHER SOCIAL AGENCY.

CASE 1. Martha O. The Brookline Court sent for observation a girl of fifteen, stating that she would stay away from home all day and often all night, and had recently gone to a hotel with a young man who promised to take her to New York. A month before she had attempted suicide. The patient was not insane nor intellectually defective. Her mother, a capable woman, employed in a position where she is well thought of, was at the end of her resources in managing the girl. By appointment, an agent from the Children's Aid Society came here to meet the mother. She has since had oversight of the girl, and reports that she has a position at clerical work in the same place with her mother, at \$8 a week; that she goes to gymnasium, and is doing very well.

CASE 2. Bessie N., had had an illegitimate child, and in the course of her efforts to find the deserting father, with the hope of making him marry her, her mind had become slightly unbalanced. In the hospital she recovered quickly.

With the help of her sister, who considered such a marriage inadvisable, and with advice from the Legal Aid Society, Bessie was persuaded to give up her search and accept the care of her child herself. It was found that she had an acute infection of gonorrhea. On her discharge from this hospital, she was referred to the proper department of a general hospital through their social service department, and she has been reporting regularly for treatment.

CASE 3. Julius R. was brought in by the police, because he was found trying to escape from imaginary people who were throwing things at him. The patient told a story that his wife was unfaithful to him and had driven him from their home in Brockton. He admitted that he was alcoholic, but claimed his wife was slack, and neglected both him and the children. The Society for the Prevention of Cruelty to Children in Brockton were asked to make inquiries about the patient, and to look into the condition of the children. The patient was transferred to Taunton State Hospital and later allowed to go home. The S. P. C. C. have the family under supervision, and have reported to us that the patient is apparently doing much better, and the wife, a woman of low mentality, after repeated efforts, has been made to clean up the house. The St. Vincent dePaul Society are paying the rent until the patient gets a steady job.

CASE 4. Timothy V. The patient, while in the hospital, said he was worried because his wife and two children had no means of support. A visitor was at once sent to see the wife, and though she was out, learned from the landlady that this was true. The Associated Charities were asked to help her, and the wife was seen, when she came in to visit her husband, and was put in communication with their office. She was also directed to take one of the children to the Children's Hospital. The patient was discharged to the Out-Patient Department with a question of cerebrospinal syphilis.



He was later committed directly to the Boston State Hospital, and the Associated Charities continued to assist the family.

GROUP IV. CASES IN WHICH PROPHYLACTIC MEASURES WERE TAKEN FOR OTHER MEMBERS OF THE PATIENT'S FAMILY.

CASE 1. Lester A., a feeble-minded boy; should have been sent to a school for special training, but as there was no vacancy, it was necessary to supervise him in his home. A few visits brought out the fact that his mother was suffering from violent headaches and "rheumatism." After an examination in the Out-Patient Department, she was advised to take hygienic baths, and gradually improved. It was also learned that her husband, a painter, was supposed to have been so affected by a fall on his head some ten years before, that his friends had not considered him normal since. He had been getting gradually worse, and had been suffering from "spells" of some kind. After much persuasion, he also came to the Out-Patient Department, and his examination showed a low grade of mentality and signs of lead poisoning. He was sent to another hospital for treatment. The mother's headaches have improved. The father was operated upon for appendicitis, and during his convalescence the family was aided financially through two charitable agencies. On recovery, he obtained a position in the Park Department. The original patient, Lester, is still at home and doing fairly well in a class for backward children.

CASE 2. Lester K., 12 years old, two months before his admission had become blind after a convulsion. He appeared frightened, his speech was defective, and he had lost flesh rapidly. The Wassermann reaction for syphilis was found to be positive, and a diagnosis was made of juvenile paresis. His parents took him home, although they were advised to have him committed to a state hospital for the insane. The mother and two brothers were examined in the Out-Patient Department and given the blood test for syphilis. The younger boy of six showed a negative reaction. In the case of the older boy, fourteen years, the test was unsatisfactory and he is to return for a second test and also for a psychological examination, as he is reported to be "dull." The mother's examination has not yet been completed.

The father was also examined and found to have a positive Wassermann reaction. Inquiry from a physician showed that he had previously been treated for syphilis. He was advised to have further treatment at once.

The father's physical condition prevented his earning enough to support the family, and the mother was obliged to go out to work. The care of Lester was too great a burden, but the parents were unwilling to send him to an institution. As the home of the family is in another city, the case was referred to the local Associated Charities. They report that the father is under the care of a physician, and the mother is partly persuaded to allow Lester to be sent to a state hospital.

CASE 3. Howard R., a married man of 28, with cerebrospinal syphilis, is receiving salvarsan treatment. His wife and two children were given the Wassermann test for syphilis in the Out-Patient Department. The children showed a negative re-

action. The reaction of the wife was positive and she was persuaded to put herself under treatment at a general dispensary. The patient's treatment quickly exhausted his small savings, and the Social Service furnished the money for salvarsan until his mother could be persuaded to pay for it. As the patient's illness left the family without support, they were referred to the Overseers of the Poor, and received temporary aid until they were transferred to the care of the Mothers' Aid Department of the State Board of Charity.

GROUP V. CASES IN WHICH HISTORY REQUIRED FOR DIAGNOSIS WAS OBTAINED.

CASE 1. James R. told a story of abuse and unfaithfulness on the part of his wife, claiming that she was a "devil at home" and wanted to get rid of him. When she had him arrested for non-support, he became so excited because he said everybody believed her instead of him, that he made a scene in court, which resulted in his being sent here for observation. He had been once before in an insane hospital, where no definite psychosis was found. At that time he had attacked his wife when drunk. He gave no evidence of a psychosis when here, and was discharged. He went on a cruise, and on his return was immediately sent in by the police. This time an investigation was made by the Social Service. Careful inquiries established the fact that the wife was a good, hard-working young woman, struggling bravely, with the help of her own family, to bring up her children nicely; was in terror of her husband, and had suffered ill-treatment from him. Indications of mental disorder were found in the history, and the patient was committed to an insane hospital. A copy of the social service history was sent with him.

CASE 2. James G. fractured his skull by falling from a scaffolding at his work, and a year later was sent to the Psychopathic Hospital for observation. It was difficult to tell to what extent his dizziness, lack of self-control and slight paralysis of the right arm were induced by the nine dollars a week which he was collecting under the Employer's Liability Act. All data at first pointed toward a diagnosis of psychopathic personality. A careful inquiry later into his character, his general health, and the events preceding and following the accident made it possible to make the diagnosis of traumatic psychosis.

GROUP VI. CASES IN WHICH ARRANGEMENTS WERE MADE IN ORDER THAT THE PATIENT MIGHT BE DISCHARGED.

CASE 1. Caroline O., an old woman, was reported to the overseers of the poor by a neighbor, who found her living alone in a tenement in destitution. The agent thought her manner strangely confused, and called a physician, who sent her here for observation. Inquiries showed that she had deserted her husband when her children were young, and had since lived alone, drinking steadily and consorting with disreputable people. She had resisted all the efforts of her daughter to induce her to live respectably.

After it was determined that she was not suffering from a psychosis, the question was, where was she to go. She was physically weak, and confused and rambling in mind, requiring the doctors' said hospital care. Her daughter was sent for, at home



with her husband. They had given up the filthy tenement in which the patient had lived, so that she might not return to it. They were not able to afford the expense of a nurse for the patient, and she was too unmanageable to be taken into their home, so that they were advised to send her to the State Infirmary. Her admission was arranged for, and, after a stubborn resistance, the patient was persuaded to go.

CASE 2. JAMES B., 65 years old, came into the hospital in a disoriented condition. A month previous he had been knocked unconscious by an engine while at work. He was a moderate drinker, but had been a steady worker for the railroad twenty-four years. His mind cleared slowly, and by the middle of the second month he was ready to be discharged. Inquiry showed that none of his five children were in a position to give him a home, and all agreed that he ought not to return to his second wife, a chronic alcoholic. Arrangements were, therefore, made to send him to his brother in Nova Scotia. There he spent four months on a farm and gained strength, so that when he came back in the fall, he returned to his work with the railroad. He lives with another brother in the city and reports to the Out-Patient Department.

CASE 3. Harriet L., 19 years old, was brought to the Psychopathic Hospital for observation, at the suggestion of the family physician. She had been in the habit of stealing from members of her family and friends ever since she was a small child, and recently had had immoral relations with several men. Unless she could support herself, her brother was not able to have her live in his family longer; but because of her habit of stealing she could not be recommended to employers.

She was found to be a high grade moron, and institutional care was recommended. An application was sent to a school for the feeble-minded, and the patient's name was put on an already long waiting list. Later, through our representations, she was listed among the "urgent" cases. Meanwhile, it was necessary to keep her under custodial restraint somewhere, and a small private institution finally agreed to take her temporarily, making an exception to their rule not to receive mental defectives.

At the end of three months, however, the matron said that she could not keep the girl any longer. She had plotted to escape with another girl, and her influence in the Home was bad. As no other place could be found, she was sent to the State Infirmary until she could be admitted to the School for the Feeble-Minded. There she took such a violent dislike to the women with whom she was associated that she was given night work, so that she would not have to be with them. At the end of three months she was admitted to the school, where she is said to be mingling well with the older girls, and seems to be happy.

CASE 4. Walter A., an unmarried man, was sent for observation, because the woman with whom he boarded claimed that he had violent fits of temper, when he would destroy clothing and furniture, and because, as he also lacked all ambition and initiative, he had been suspected of mental defect.

Inquiries from neighbors in the country town

where the patient had boarded, showed that he was not considered harmful by neighbors who saw him daily. The landlady was reported to be a woman with whom "an angel from heaven" could not live peacefully. On the wards his conduct was excellent. The nurse in charge reported that he was one of the most willing and obedient patients she had ever had. The diagnosis of dementia precox simplex was made, and the patient was not considered committable.

As the patient's mother had left him some property, in charge of a guardian, board could be paid for him at \$5.00 a week. A place in the country was found in the family of a widow and her daughter, where he could help with the chores, and perhaps obtain some work in the neighborhood. We have received several letters from the patient, telling how much he likes his new home. The family are well satisfied with him and are delighted that they have a permanent boarder.

## Original Articles.

### AN EXPEDIENT FOR THE RADICAL CURE OF SOME RETROVERSIONS.

BY EDWARD REYNOLDS, M.D., BOSTON.

THE choice of treatment for most retroversions of the uterus has long been settled in favor of operation, rather than the pessary. The majority of the retrodeviations are dependent either on inflammatory complications which can be relieved only by operation, or are the result of minor abnormalities in the supporting mechanism which predispose to retrodisplacement and which will predispose to its recurrence unless they are corrected by operation. The pessary is, as a rule, a palliative rather than a cure, and should be so regarded and described.

Occasionally a recently retroverted uterus, occurring as the result of a fall or during puerperal relaxation, will remain permanently forward after a few months' use of pessaries and their gradual reduction in size during the process of dispensing with them; but these cases are few and belong to a class by themselves. For the rest, the use of pessaries may be judiciously restricted to those cases of uncomplicated retrodisplacements in which it is desirable to postpone an operation for some reason in the circumstances of the patient; and prominent among these are the not infrequent cases of women in the child-bearing period who desire to postpone an operation until after the family is completed. Such women not infrequently endure the annoyance of a pessary for many years except when pregnant, having it reinserted so soon as they are out and about, a few months after childbirth, and wearing it until well advanced in the next pregnancy.

A considerable experience has convinced me that these women form the only class, outside of the very few acute cases mentioned above, in



which retroversion is curable by means of a pessary; and my experience further leads me to believe that most such cases (of uncomplicated retroversion) are so curable. (I am referring only to cases in which the uterus is freely replaceable and in which a properly fitted pessary is worn with comfort.)

In these cases the vagina is usually capacious, the uterus somewhat heavy, and all the tissues relaxed. Labor is usually rapid and the perineal floor either intact or sufficiently good to furnish thorough support for the pessary. Cases in which the pelvic floor is extensively lacerated do not come within the class which I am discussing, and, indeed, are seldom comfortable with a pessary.

The treatment ordinarily adopted in the management of these retroversions is that the pessary is removed before the middle of pregnancy, and is not replaced until the woman again complains of backache and bearing-down sensations, which is usually when the child is from six weeks to three months old. The uterus is then replaced and the pessary reinserted. If such a case is closely observed it will be found that the uterus returns to its retrodisplacement at approximately the end of the third week of the puerperium; it then usually remains heavy and subinvolved until it is replaced and a pessary inserted.

The structures which support the uterus are all muscular—they are all, from a physiological standpoint, uterine adnexae, *i.e.*, they are as much a part of the uterus as an ell is a part of a house. They evolve (increase in size and lose rigidity) with the uterus during pregnancy; they involute (shorten and resume firmness) with the uterus during the puerperium.

These considerations furnish the all-important point. If these structures are allowed to involute during the puerperium, with the uterus held by its own weight and by the intra-abdominal pressures in a retroverted or retroflexed position, they of necessity possess at the end of their involution the degree of length and relaxation which results in an absence of tension, *i.e.*, in a comfortable adjustment of tensions, with the uterus in this abnormal position. They are no longer capable of sustaining the uterus in its proper position. They remain relaxed and subinvolved with the uterus until the organ is replaced and raised by a pessary. A universal experience has shown that they do not then undergo sufficient resumption of activity to enable them to perform their supporting functions effectively.

All that is necessary to secure effective puerperal involution of the supporting structures, and a cure of the retroversion, is so to arrange the puerperium that the supporting structures undergo involution, and complete involution, while the uterus is held in an extreme forward position. Under these circumstances the supporting structures will almost invariably shorten

and resume firmness to a degree which will hold the uterus permanently in a normal position.

At a period in the puerperium at which the uterus is too large to be capable of retroverting, *i.e.*, between the tenth and fifteenth day of the puerperium, the uterus should be thrown into strong anteversion bimanually, and a carefully fitted, hard rubber pessary should be made to hold it there. Such a pessary will usually be larger than the stock sizes and must often be specially procured. Very hot vaginal douches should then be administered twice daily. From two to four quarts should be used, and the injection should last from fifteen to twenty minutes. It should be given with a fountain syringe and under a fall of not more than twelve to fifteen inches in order to avoid forcing fluid through the open os.

In this position of the uterus and under the influence of the hot douches involution is usually very rapid. In most cases it will be found that within a week the original pessary will have become too large and too highly curved for the contracting vagina. A second and smaller, but equally well fitting, pessary should then be adjusted, and the douches continued. This will usually need to be replaced by one of lesser size in from ten days to a fortnight, and after a few weeks this must again be reduced. The hot douches should be continued until the uterus is but little above the normal size and firmness, but should then be intermitted, as too long a continuance of the douches sometimes results in hyperinvolution, which might cause subsequent dysmenorrhea.

Uncomplicated retroversion is not a serious lesion, but it is not so innocuous as some general surgeons would have us believe. Women with retroverted uteri are always more liable to inflammatory attacks from slight exposures than those with normally placed organs. The majority of them have backaches and uncomfortable catamenia; most of them, sooner or later, seek relief. Unnecessary operating is objectionable. The prolonged use of a pessary is dangerous if the instrument is not frequently cleaned and repolished more dangerous than most practitioners realize. If it is properly cared for it is in many minor ways more objectionable than any one but the patients realize. The prolonged use of a pessary is a worse thing than an operation in the majority of cases. It is tolerable only when an operation is, for some reason, inadvisable.

The relief of the class of multiparae which I have attempted to define by the simple means described has been with me so nearly uniformly successful that I am surprised that the method has not attracted general attention. As I have never seen it published, I am led to put it on record as worthy of wider use, but with the caution that the use of large pessaries during the early part of the puerperium demand special care and probably a reasonable degree of special



skill, to say nothing of asepsis. I have never seen harm result, but am so far sure that carelessness might easily result in trauma, that I would not recommend the procedure, valuable as I believe it to be, to practitioners who are not in the habit of using pessaries, nor familiar with the process of fitting them to the individual case.

## ETHER ANESTHESIA.

By H. H. AMSDEN, M.D., CONCORD, N. H.

*Visiting Physician, Margaret Pillsbury General Hospital.*

WHILE intraspinal, intravenous, rectal and gas-oxygen anesthesia are indicated in selected cases and in skilled hands, yet ether by inhalation remains the safest, simplest, and most economical anesthetic for general surgical purposes. Gas-oxygen is, doubtless, the ideal general anesthetic, if administered by an expert, but otherwise it is not as safe as ether, and the cost prohibits its use in all but a small number of cases.

The researches of Boothby, Henderson, Bryant, Hewitt and others have apparently established two facts regarding the physiology of anesthesia: (1) A definite ether percentage is necessary, below which it is impossible to maintain anesthesia, and above which there is danger of overdosage. Boothby has experimentally established these limits as from 15% to 30%. (2) A certain amount of re-breathing is desirable, as loss of  $\text{CO}_2$  is thereby prevented; this is claimed to be an element in the causation of shock.

The best method is the one which permits the giving of a concentrated ether vapor, in such manner as to prevent excessive  $\text{CO}_2$  loss, or, in other words, a closed rather than an open ether; yet the open drop method is, doubtless, used more extensively than any other today, in this country at least. An ideal ether would call for the following points: (1) Safety; this factor largely depends upon the anesthetist, more than upon the method or apparatus used. It is necessary to watch the patient's color, pupillary reflex, depth and rate of respiration, and pulse, and unless the anesthetist is fully aware all the time of the patient's condition in these respects, the factor of safety is not provided for. (2) Simplicity; while ether apparatus doubtless facilitates its administration, it is not available for general use, in private practice, or in small hospitals. (3) Economy; other things being equal, the method which uses the least ether is most desirable. (4) Comfort; absence of choking, coughing, initial vomiting, or struggling, minimum secretion of mucus, and minimum amount of post-anesthetic nausea.

A preliminary hypodermic of morphine and atropine should be given to adults, and atropine by mouth to children. The Allis or similar open

cone is used for preliminary anesthesia. The cone is placed over the patient's face, and he is allowed to breathe for a minute or two before the anesthetic is started. A few drops of alcohol, menthol solution, or some mild perfume is then dropped on the cone, followed by a few drops of ether. The gradual administration of ether by the drop method is essential for a smooth initial anesthesia; under no circumstances should enough be given to cause coughing. As the stage of excitement is reached and the respirations become deeper and more rapid, it is necessary to give a higher percentage, and this can be done by putting on more ether and by covering the cone with the hand or with a folded towel. It is essential to obtain full surgical anesthesia before discarding the cone, as the patient cannot easily be carried by the stage of excitement and deep breathing, unless the cone used permits the giving of a closed ether. It is very difficult to obtain a sufficient ether percentage under these circumstances with any mask or device which does not permit complete exclusion of air if desired, as only in this way can the necessary percentage be obtained. After full surgical anesthesia is secured, the cone is replaced by a sponge consisting of six or eight layers of coarse mesh gauze laid directly over the nose, which has previously been smeared with vaseline. The chin is held up with one hand, thus closing the mouth, so that respiration is wholly nasal. The ether is dropped on the sponge directly over the nostrils. The practical results of this method are a smooth ether, with minimum secretion of mucus; the patient's color is pink, and anesthetic equilibrium, so to speak, can be maintained, so that, while the patient can be held always under surgical anesthesia, yet the anesthesia is so light that there is no danger of overdosage.

This primitive method of etherization seemingly contradicts the statement that a closed, rather than an open, ether is desirable. The advantages of the closed method are high ether percentage, and re-breathing. When we study more closely what really happens with the method described, it is evident that it is possible to secure a high percentage in this way; the ether is dropped directly over the nostrils and inspired immediately, and if the dropping is timed to coincide with inspiration, very little ether is lost by evaporation. As regards re-breathing, it is apparent that if respiration be wholly nasal and a moist sponge be laid directly over the nose, expiration is sufficiently obstructed to secure a certain amount of re-breathing.

The most important detail in this method, however, is its use of the nose as the sole route of inspiration. The physiology of the nasal mucous membrane has apparently not been sufficiently considered, in its relation to anesthesia, namely, its function of warming and moistening inspired air. If nasal respiration is physiologically proper, then it would follow that the



nasal route is the proper one for anesthesia. It is claimed that warm ether vapor is preferable, because it is less irritating to mucous membranes, and because the loss of body heat which is expended in warming the ether vapor is detrimental. Leaving out of the question the possibility of warming ether vapor, which is denied by some authorities, it may be said that the heat loss entailed is negligible, and that if the nasal route is adopted and the functions of the nasal mucous membrane utilized, warming the vapor is totally unnecessary. Another noticeable feature with this method is the small amount of mucus secreted. Ether vapor is irritating to mucous membranes, and if inspired directly through the mouth, a copious secretion of mucus occurs, whose presence in mouth and throat is very annoying and may be dangerous. It is probable that the presence of a large amount of ether-laden mucus in the stomach is partly responsible for post-anesthetic nausea and vomiting. If the nasal route is adopted, the secretion of mucus is much diminished.

The adoption of this method presupposes free nasal passages, and the presence of polypi or adenoids may render its use impossible. In some cases in which the nose is clear it will be found that the alae nasi collapse on inspiration, preventing free ingress of air. Some device to hold the nose open may be necessary, and a simple one is three medium size safety pins, two of which are inserted in the nostrils, while the third, lying across the columella, holds the others in place.

The results of this method as used in some 300 cases, show that it conforms very closely to the standard set for an ideal ether, namely, safety, simplicity, economy and comfort.

### Book Reviews.

*The International Medical Annual. A Year Book of Treatment and Practitioner's Index.* New York: William Wood & Company. 1915.

The English edition of this standard British Year Book for 1915 was reviewed in the issue of the JOURNAL for October 28 of that year (Vol. CLXXIII, p. 672). This American edition for 1916, being the thirty-fourth annual issue, is this year more punctually published. It is notable for the large amount of space devoted to naval and military surgery, to which a special section is given at the end of the dictionary of new treatment. Special injuries to organs and nerves are considered under their proper headings in the body of the work. Other branches of medical study are not neglected. The most notable changes in the list of contributors this

year are the absence of the late Sir Charles Bent Ball, who for eight years was a collaborator in the production of the Annual, and the addition of the names of Dr. Lewis A. Conner and Dr. J. Ramsey Hunt of New York, who have assumed charge respectively of the sections on pulmonary diseases and diseases of the nervous system. The volume is illustrated with fifty-three full-page plates and sixty-four text cuts, a considerable reduction from the number in the previous volume. The number of reading pages, however, remains the same. The volume maintains its standard of value and has new and unusual features of interest.

*The Practical Medicine Series.* Comprising ten volumes on the year's progress in Medicine and Surgery. Under the general editorial charge of CHARLES L. MIX, A.M., M.D., Professor of Physical Diagnosis in the Northwestern University Medical School. Volume V. *Pediatrics*. Edited by ISAAC A. ABR, M.D., Professor of Pediatrics, Northwestern University Medical School, Attending Physician Michael Reese Hospital. With the collaboration of A. LEVINSON, M.D., *Orthopedic Surgery*. Edited by JOHN RIDLON, A.M., M.D., Professor of Orthopedic Surgery, Northwestern University Medical School. With the collaboration of CHARLES A. PARKER, M.D. Series 1916. Chicago: The Year Book Publishers. pp. 232, 1916.

This little book, which is one of a series of ten, published annually and devoted to the progress of the year in medicine and surgery, is made up of abstracts from periodical literature with editorial comments. The articles chosen for review are on the whole well selected and fairly representative of the thought of the year in pediatrics and orthopedic surgery. The editorial comments in the section on pediatrics are good. Those in the section on orthopedic surgery seem to the reviewer to show considerable personal bias and to be more caustic than necessary.

*Gynecology.* By WILLIAM P. GRAVES, M.D., F.A.C.S., Professor of Gynecology at Harvard Medical School. Octavo volume of 770 pages with 424 original illustrations, 66 of them in colors. Philadelphia and London: W. B. Saunders Company. 1916.

This latest work on Gynecology is based on the wide experience of the author in the pathological laboratory, clinic, operating room and class room. It is designed both as a textbook and as a general reference book of gynecology.



in one volume. Thus, from the start it was composed under a serious handicap which the division into three parts cannot overcome.

The first part deals with the physiology of the pelvic organs and with the relation of diseased pelvic organs to other parts of the body. It is the most valuable section of the book and Graves has rendered a distinct service to American students in emphasizing the point of view and stating the facts so familiar to German investigators. Space did not permit more than this too brief yet suggestive treatment of the subject, and the literature, to which especial reference is here made, should be far better known.

The second section is "designed primarily for the undergraduate student who is taking his initial course in gynecology." Whether the needs of the third year students in our best medical schools, for whom presumably the book is written, are best met by so "compact" a presentation is at least questionable. Many high educational authorities advocate more detailed and comprehensive studies for university men.

"The third part is devoted exclusively to the technic of gynecologic surgery" and also shows the defect of too great "compactness."

The style is direct, clear and pleasing, so that one reads easily page after page without being disturbed by the grammatical and rhetorical infelicities so common in current American medical literature. The book is thoroughly up to date and does not contain the vast amount of discarded material one finds in even recent editions of some older works. Perhaps too much has been rejected, but the book is a refreshing departure in this respect, and actually contains considerable information not easily accessible elsewhere. More detailed references to the literature, however, would give great enhancement of value. The illustrations are, in general, excellent, many of them by the author himself. But the propriety of so many representations of microscopic sections in a work of this character is doubtful. While some are characteristic and helpful, others might be dispensed with easily.

*Oral Abscesses.* By KURT H. THOMA, D.M.D.  
Boston: Ritter and Company, 1916.

The recognition of the importance of infections associated with the teeth as modes of entry for systemic diseases, and as reservoirs of infection from which repeated metastatic distribution may occur throughout the body, is relatively recent, and has resulted in the rapid development of a new and large technical field in dentistry. At the same time it has resulted in a much closer coordination between dentistry and medicine and should do much to break down the unnatural demarcation hitherto existing between the two. Not only is knowledge of general medical diseases essential to the den-

tist, but equally essential to the physician is an understanding of the phenomena of dental infection and its relation to the somatic diseases which it is his part to treat.

The present volume, by an author hitherto well known for his work in oral anesthesia, aims to supply a book which shall furnish, both to the dentist and to the general practitioner, the necessary information for their mutual instruction in the nature and progress of dental infections, their relation to the general health and their treatment. It is divided into a series of twelve chapters dealing systematically with successive aspects of the subject and abundantly illustrated with 293 figures presented on seventy-nine full-page plates, of which a number are colored. There is an excellent terminal alphabetic bibliography of about 100 titles on the subject. The book is well and clearly printed, and is highly commended to both dentists and physicians.

*Practical Bacteriology, Blood Work and Animal Parasitology.* By E. R. STILL, A.B., PH.G., M.D. Fourth Edition Revised and Enlarged. Philadelphia: P. Blakiston's Son and Company, 1916.

This fourth edition of a well-known laboratory manual, originally based on the author's experience as a member of the United States Naval Examining Board, aims to incorporate a large amount of new material without materially increasing the size of the book. This has been accomplished by a greater use of paragraphs on minor subjects in small type. A further economy of space is effected by printing tables and other material on the inside of the covers and on the fly leaves. In spite of all these economies, the volume is increased nearly one hundred pages over the preceding edition. Every chapter in the book has been carefully revised and in many instances, rewritten. A new chapter has been added on diseases of doubtful or recently determined etiology, such as beri-beri, pellagra, oryza fever, veruga Peruviana, Rocky Mountain spotted fever and sprue. In the appendix a new section has been added on clinical blood examination and a section on anatomic and physiologic norms. Many new tests are, for the first time, incorporated in this edition, such as the Schick and colloidal gold tests. The volume is conveniently divided into four parts, dealing respectively with bacteriology, study of the blood, animal parasitology and the clinical examination of the various body fluids and organs. An appendix contains bacteriological keys, zoölogic tables and explanatory clinical notes. The book is illustrated with four plates and 115 other cuts, containing 505 figures. It should maintain its value as a comprehensive laboratory text-book and manual.



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## THE DOTEN BILL.

On page 840 of this issue of the JOURNAL appears the full text of the Doten Bill, House No. 1015. The importance of this bill is so great that everyone should become familiar with its major points. The measure, if it becomes a law, and if it has the effect in this country which it has had in Great Britain and in Germany, should increase materially the health of the industrial class through providing earlier medical care and through the reforms in industrial sanitation which will be brought about.

The effect of health insurance upon the practice of medicine is less easy to predict. That it will inaugurate changes of great significance seems highly probable and for that reason, if for no other, every physician in this state should read carefully the full text of the bill. Briefly stated, the system of insurance as outlined by the bill is as follows:

The state is divided into districts in which local health organizations, or organizations comprised of workers in certain trades, are formed. In one of these associations every person employed for compensation not greater than one hundred dollars a month must be enrolled. Certain persons, such as federal employees and those already provided for, are exempted. Certain other workers who are not employed at a regular wage, such as those working at home, may enroll if they wish.

These local associations or "carriers" are supported by contributions from employees, employers and the state. Of the two former, each pays two-fifths; the state, one-fifth. In the case of employees earning nine dollars a week, or less, the proportion paid by the employee becomes less as his wage diminishes. In the case of those earning only five dollars a week the employer pays the entire four-fifths.

In return for this expenditure, the employee gets medical, surgical and nursing care, treatment in a hospital if needed, sanatorium treatment for tuberculosis and a cash benefit for the support of his family while he is unable to work. The cash benefit is given for as long as 26 weeks and amounts to two-thirds of the man's wages if he is at home, or one-third if he is in a hospital. Women get obstetrical care, and perhaps may receive cash benefits during confinement.

The administration of the whole matter is in the hands of three commissioners who are full time, salaried officials. To advise with these there is a council, called the Social Insurance Council, composed of twelve members, six representatives of employers and six of employees. This council meets at least four times a year. Each local health or local trade health association is governed by a committee of from twenty to two hundred members and by a board of directors of eight to eighteen members elected by the committee. Employers and employees are equally represented upon these boards.

As to the manner in which medical service is to be rendered, the bill is very nearly silent.

Part II, Section 3, states that all necessary medical, surgical and nursing attendance and treatment shall be furnished by the carrier. "In case the carrier is unable to furnish the benefit provided for in this section, it must pay the cost of such service actually rendered by competent persons at a rate approved by the commission."



Part II, Section 4, states that "the carriers, subject to the approval of the commission, shall make organized provision for medical, surgical and nursing aid by duly qualified physicians, surgeons and nurses, or through institutions or associations of physicians, surgeons and nurses as required by this act."

Part II, Section 6, "Hospital or sanatorium treatment and maintenance may be furnished instead of all other benefits. . . This benefit may be provided in those hospitals with which the associations and societies have made satisfactory financial arrangements which have met the approval of the commission or in hospitals erected and maintained by the associations and societies with the approval of the commission."

The board of directors of the local associations shall have the power to "make contracts with physicians, hospitals, pharmacists and any other persons necessary for the business of the association." It seems, therefore, that the relation of the association to the physician is left to the discretion of the board of directors of each association, subject to the approval of the Social Insurance Commission. Probably these relations will vary in different localities. In smaller communities all the local practitioners may serve on the panel of the association, whereas in larger communities, particularly those given over to well-organized industries, the insurance associations may have their own staff of physicians and even their own hospitals.

The question of choice of physicians by the sick is not mentioned in the bill. Doubtless it was felt by the authors of the bill that the powers given to representatives of employees would be sufficient to insure conditions satisfactory to the insured. The situation thereby differs from that now obtaining in regard to the Workingmen's Compensation Act, in the machinery of which employees have only the very remotest authority. The effect of the Doten Bill upon the medical profession is impossible to foresee. In England, in spite of the fact that the insurance system embodies some unsatisfactory features which the Doten Bill will avoid, the sum set aside annually for the remuneration of physicians is nearly twice the average physician's income before the insurance went into force.

From the point of view of the practitioner, health insurance, so far as it tends to cut down the number of patients now receiving charity treatment, is excellent and a just measure. The

profession, however, must be united in insisting upon fair remuneration for services rendered. The doctor will no longer be independent, but will be responsible to the association which employs him, and this responsibility should check the tendency, inherent in all contract practice, to perform one's work in a machine-like and superficial manner. He can look to the association for payment for his services, and in these ways the financial side of medical practice should be on a more business-like basis.

Once more we beg all physicians to consider this bill most carefully and, with unprejudiced mind, answer these two questions: Will health insurance improve the public health? Will it improve the condition of those who have invested so much time and money in order to acquire the equipment necessary for the practice of medicine?

#### RETROVERSION AND PTOSIS.

IN another column of this issue of the JOURNAL we publish a valuable article by Dr. Edward Reynolds of Boston, pointing out the possibility of successful treatment and radical cure of certain cases of uterine retroversion without surgical operation. With this article we wish to take a single exception, and that is to its first sentence. Though it is doubtless true that a majority of surgeons treat the majority of retroversions by surgical operation, rather than with the pessary, we believe it is far from being settled that this preference is judicious, sound and necessary.

As a matter of fact, the majority of uterine retroversions are really but one of the many manifestations of visceral ptosis. The failure of many men successfully to correct retroversion by the use of the pessary, and the consequent disrepute into which that valuable appliance has fallen, are due largely to the non-recognition of this fact and the consequent failure to employ the other necessary mechanical means for the correction of the associated ptosis. It is manifestly often difficult and frequently impossible with a pessary to sustain permanently the retroverted uterus in the face of superincumbent enteroptosis. Not until the prolapsed intestines are raised and held by a properly applied corset, can the uterus, whose retroversion, in the absence of adhesions, is usually maintained solely by their weight, be



restored and held in its own normal position. Moreover, not infrequently the mere correction of enteroptosis by proper corseting is alone sufficient to make the retroverted uterus rise of its own accord into normal position, without further manipulation or apparatus. The pessary is not to be regarded, therefore, as a permanent appliance, but as a temporary splint to be used merely until the retraction of stretched ligaments insures the permanent maintenance of normal position. Without the simultaneous correction of intestinal ptosis, the use of the pessary either is unavailing or must be permanently maintained; with the correction of such ptosis, the pessary can usually be dispensed with permanently within a few months. The employment of the *donche*, as Dr. Reynolds points out, is a valuable adjuvant to this method of treatment since it assists the depletion of engorged pelvic tissues and expedites the involution of uterus and ligaments.

It is doubtless true that in nulliparae the correction of retroversion by this method is much more difficult than in parous women. Oftentimes a preliminary period of treatment with douches and the correction of abdominal ptosis by a corset should be followed in these cases by manual replacement of the uterus and insertion of a suitable pessary under ether, following which the pessary may generally be removed at the end of a few months without the recurrence of the retroversion, provided the use of the corset and douche has been faithfully continued. With patience and perseverance nearly as large a percentage of results may be obtained in these cases as in those of parous women. In the latter class of cases, the use of douches and suitable corsets should be begun at the end of the second week of the puerperium, provided retroversion then exists and there is no septic or other complication. It is our firm belief that by the intelligent and correct employment of this method, which rests, as we have said, upon recognition of the fact that the majority of uterine retroversions are really a manifestation of visceral ptosis, a majority of such cases may be radically and mechanically cured, leaving the employment of surgical operative procedures for the relatively limited minority of cases in which the uterine retroversion is caused, complicated or maintained by pelvic inflammatory process, neoplasm, or adhesions.

## STANDARDIZATION OF FIRST-AID METHODS.

AMONG the various activities and endeavors inspired by the theory of national preparedness, that of the spreading of first-aid knowledge among laymen deserves high commendation. Dr. Joseph C. Bloodgood of Baltimore first brought forward the idea of a standardization of first-aid methods, reducing such procedures to simple terms, teaching them to laymen and thereby saving, by prompt action, lives and health otherwise lost and endangered by inability on the part of laymen to meet emergencies. Through his efforts the American First-Aid Conference was held in Washington on August 24, 1915. For several sessions the assembled doctors debated the problem of preventive surgery from the layman's point of view and planned an organization which was effected before they adjourned. This first organization, under the presidency of Dr. William C. Gorgas, surgeon-general of the army, had no money and its labors were all voluntary. It was suggested that President Wilson appoint a board who might be empowered to carry on the work of such an organization. This the President did, calling the new board the Board on Standardization of First-Aid Methods and naming Dr. Richard H. Harte of Philadelphia chairman. The vice-chairman is Colonel Louis LaGarde of the Marine Corps, and Dr. W. C. Rucker, assistant surgeon-general of the United States Public Health Service is secretary. The other members consist of Dr. J. P. Kaster, chief surgeon of the Atchison, Topeka and Santa Fe Railroad; Dr. Samuel C. Plummer, an authority on fractures, and Dr. Shelton Horsley on emergency surgery. Major R. V. Patterson of the Marine Corps is well known through his position with the American Red Cross, and Surgeon A. M. Fauntleroy will be remembered for his striking and useful work on the "Medical Aspects of the European War."

"One of the first steps necessary to the work of the new board was to get funds with which to proceed. Chairman Fitzgerald of the Committee on Appropriations, thought well of the idea and the board was given \$2,000, although, curiously enough, it was placed under the nominal control of the Bureau of Labor Statistics of the Department of Labor. Dr. Royal E. Meeker, chief of the Bureau of Labor Statistics, welcomed this new child to his fold, but he readily recognized that the task ahead of the board was one for specialists, and, although the law re-



quires that the board shall act in collaboration with his bureau, Dr. Meeker has been wise enough to give it as free a hand as if it were an independent organization.

"The board is now engaged in collecting expert opinions from a selected group of 5,000 of the best surgeons in the United States, which will enable it to place first aid on a uniform standard basis. A questionnaire covering the main points on which the board desires information has been sent out recently, and already Secretary Rucker is flooded with letters expressing the most cordial endorsement of the standardization idea and promising hearty cooperation. This ready response is really a matter of patriotic self-sacrifice on the part of the surgeons to whom appeal has been made, for each of them will need to give much time and thought to the 61 answers which he has been requested to make. Every sheet of the questionnaire bears at the top the legend: 'Please answer all questions from the viewpoint of what is best in the hands of the layman.' In other words, the board wants to know, not what the surgeon would do in case of accident, but what the injured man or those about him could and should do.

"The work of the Board on Standardization of First-Aid Methods necessarily is twofold. The surgeons who compose the board must first collect and collate the information they receive, and devise their system in accordance with their conclusions, and then they must get this knowledge out to the people. It is the dream of Secretary Rucker that in time a first-aid package, with instructions how to use it, shall have a place in every home in the land. Such a consummation will cost money, and this money must be provided, much of it by the Government, some of it, possibly, through the sale of first-aid kits—although in this connection it might be said that if the Government can afford several hundred thousand dollars a year with which to supply voters with garden seeds it would be equally warranted in sending out first-aid packages. In fact, it is believed that as soon as congressmen appreciate the practical utility of this great scheme for conserving human life they will find a way of their own to pass its benefits around in their districts. The paltry \$2,000 with which the board starts is only a drop in the bucket to what will be needed, but the plan would appear certain to receive enthusiastic popular and congressional support as soon as its features become known."

## MEDICAL NOTES.

**ERADICATION OF HOOKWORM IN BRAZIL.**—Report from San Paulo, Brazil, on November 18, states that the health officers of Rio de Janeiro have announced their acceptance of the offer of the International Health Board of the Rockefeller Foundation to cooperate with the Brazilian government for the eradication of the hookworm in that country. Dr. Lewis Wendell Hackett of the Harvard Medical School has been sent by the Rockefeller Foundation from New York to San Paulo to take charge of the work. The hookworm is extensively endemic among laborers on the coffee plantations in San Paulo, where three-quarters of the Brazilian coffee crop and nearly one-half of that of the entire world is grown. The parasites breed most extensively in the wet, shady soil of the tropical climate. The economic loss to planters due to lack of efficiency on the part of laborers infected with hookworm disease is very great. The anemia of many of these workmen is so profound that they are unable to work more than three or four hours a day. In Porto Rico, where the hookworm has been virtually exterminated by the United States Government, not only has there been a marked reduction of the death rate but the labor output has been enormously increased and the cost of production correspondingly diminished. Instead of thymol it is planned in Brazil to employ the oil of chenopodium in the treatment of the disease. Chenopodium grows as a common roadside weed in eastern United States, but the principal source of production of the drug is in the islands of Java and Sumatra and in the Levant.

**TYPHUS FEVER IN MEXICO.**—During the week ended October 21, 1916, 334 cases of typhus fever were reported in the federal district of Mexico, including Mexico City.

**PREVALENCE OF DISEASE IN VIRGINIA.**—The weekly report of the United States Public Health Service for November 17, 1916, states that during the month of September there were reported in Virginia 16 cases of cerebro-spinal meningitis, 2118 of malaria, 28 of pellagra, 64 of poliomyelitis, 8 of smallpox and 756 of typhoid fever.

**AWARD OF VON GRAEFIE PRIZE.**—It is announced that the German Ophthalmological Society has divided between Dr. Lindner of Vienna and Dr. Ohm of Bottrop the von Graefie prize for the best article published in 1911 to 1913 in the *Archiv für Ophthalmologie*. These articles were respectively on "Miner's Nystagmus" and on "Trachoma and Inclusion Blepharorrhoea."

**RETURN OF AMERICAN PHYSICIAN.**—Dr. Charles A. Powers of Denver, Colorado, has



recently returned to the United States after a service of six months at the American Ambulance Hospital at Paris.

#### EUROPEAN WAR NOTES.

**WAR RELIEF FUNDS.**—On Dec. 2 the totals of the principal New England relief funds for the European War reached the following amounts:

French Wounded Fund .....	\$161,540.38
Armenian Fund .....	107,227.95
Serbian Fund .....	105,291.30
Surgical Dressings Fund .....	58,794.66
Polish Fund .....	49,531.33
Permanent Blind Fund .....	37,108.11
Italian Fund .....	27,873.54
German Widows' Fund .....	25,000.00
LaFayette Fund .....	21,002.53
Russian Refugees' Fund .....	5,667.17
Wittenberg Prisoners' Fund ..	1,889.15

#### BOSTON AND NEW ENGLAND.

**WEEK'S DEATH RATE IN BOSTON.**—During the week ending Saturday noon, December 2, 1916, the number of deaths reported was 232, against 243 for the same period last year, with a rate of 15.90, against 16.93 last year. There were 32 deaths under one year of age, against 31 last year, and 81 deaths over 60 years of age, against 90 last year.

The number of cases of principal reportable diseases were: diphtheria, 40; scarlet fever, 24; measles, 16; whooping cough, 3; typhoid fever, 2; tuberculosis, 40.

Included in the above were the following cases of non-residents: diphtheria, 10; scarlet fever, 6; tuberculosis, 6.

Total deaths from these diseases were: diphtheria, 3; typhoid fever, 1; tuberculosis, 13.

Included in the above were the following deaths of non-residents: diphtheria, 3.

**AN INGENIOUS EVASION OF THE NARCOTIC DRUG LAW.**—The Collector of Internal Revenue at Boston has received reports of several cases where drug addicts have called on druggists and pretended to be internal revenue inspectors. In these cases, the person calling would ask to be allowed to examine the records of the druggist and his stock of narcotics, and while pretending to make the examination would secrete and carry away whatever morphine, cocaine, etc., was available. This has resulted in small amounts of drugs coming unlawfully into the possession of drug addicts and disarranging the records which dealers are required to keep.

Such frauds are entirely unnecessary, because the internal revenue inspectors authorized to examine druggists' records are all furnished with credentials in the form of pocket commissions signed by the Commissioner of Internal Revenue, William H. Osborn, by Deputy-

Commissioner David A. Gates, or by Collector of Internal Revenue John F. Malley.

Druggists should not allow anyone to inspect their stock of narcotic drugs, unless satisfied of the authority of the inspector. In the case of internal revenue drug inspectors, the druggist should ask to see the officer's credential card, in order to avoid impersonation and fraud.

**THE CAMBRIDGE HOSPITAL NEEDS.**—The Trustees of the Cambridge (Mass.) Hospital have recently issued the following appeal for funds describing the work of the Hospital and its needs for the future continuation of its service:

"For thirty years the Cambridge Hospital has been ministering to the needs of the citizens of Cambridge and until now has never made a general appeal for funds to increase its plant and, therefore, its usefulness. The trustees have been fully alive to their responsibilities, however, and additions have been made as funds have from time to time been available from legacies.

"Through a legacy of Mrs. Scollard, in 1913, a large addition was built and the number of beds in the hospital was doubled. A maternity ward also was added.

"These increased facilities have enabled the hospital to care for a much larger number of patients than heretofore, the number for 1915 being one-third larger than that in 1914, and consequently more nurses are required to take care of the patients. The accommodations of the nurses' home are entirely inadequate and the hospital must in some way provide accommodations for these additional nurses.

"An out-patients' building, where preventive and social service work can be done properly, is especially desired. This department is now located in the basement of the nurses' home—the only place which has been available. During 1915 there were nearly 8000 calls for treatment, and satisfactory work cannot be done in such quarters. There is needed \$30,000 for the addition to the nurses' home, \$20,000 for the out-patients' building and \$50,000 for endowment to offset increase in running expenses. Income from our present endowment from patients and donations left a deficit of \$12,376 in 1915.

"One hundred thousand dollars, therefore, are imperatively needed to enable the trustees of the hospital to take care of the increasing demand for its facilities and maintain its high standard of service. Will you not help us either by a gift now, or distributed over two to five years? The sum of \$58,000 has been paid or promised to date from 200 persons and the trustees have broken ground for an out patient building, hoping to have sufficient funds by spring to provide for an improved nurses' home.

"Checks may be sent to James L. Paine, treasurer, Cambridge Hospital Building Fund, 9 Waterhouse Street, Cambridge."



**HOSPITAL BEQUESTS.**—The will of the late Fannie Channing of Milton, Mass., which was filed for probate at Dedham, Mass., on November 27, contains bequests of \$5000 each to the Boston Floating Hospital and the Nursery for Blind Babies, \$2000 each to the Channing Home and the Perkins Institute for the Blind, and \$500 to the Milton Convalescent Home.

**POLIOMYELITIS IN MASSACHUSETTS.**—During the month of November, 179 cases of poliomyelitis were reported in Massachusetts, making a total of 1892 since Jan. 1. Four cases were reported in the first two days of December.

### Obituary.

#### JOHN BENJAMIN MURPHY, M.D.

DR. JOHN BENJAMIN MURPHY, who died of heart disease in Chicago on August 11, 1916, was born at Appleton, Wis., on December 21, 1857. After graduating from the University of Illinois, he received the degree of M.D., in 1879, from the Rush Medical College, Chicago. After practicing his profession for a few years, he pursued his medical studies further in Germany, returning to Chicago in 1884, where he rapidly gained a reputation as a brilliant and ingenious surgeon. It was perhaps his invention of the intestinal button known by his name which, in 1892, first brought him into international prominence. In 1893 he reported to the New York Academy of Medicine his first series of twenty-two cases of cholecystenterostomy for non-malignant disease.

In 1895 Dr. Murphy was appointed professor of clinical surgery at the Chicago Post-Graduate School, and later became chief of the department of surgery in Northwestern University Medical School. He was for many years chief surgeon to the Mercy Hospital, Chicago. In 1898, independently of Forlanini, he suggested the treatment of unilateral disease of the lungs by artificial pneumothorax induced by the injection of nitrogen into the pleural cavity. His name is also associated with the postural treatment of peritonitis, the use of rectal seepage, arterial anastomosis and the extra-articular wiring of fractures of the olecranon. He was highly successful in cartilage and bone grafting and devised an operation for the lysis of ankylosed joints by the interposition of a flap of fascia between the free surfaces of the bone ends.

Dr. Murphy was a member of many medical societies and the recipient of numerous honors. He received the honorary degree of LL.D. from the University of Illinois in 1905, and that of M.Sc. from the University of Sheffield, England, in 1908. He was a fellow of the American College of Surgeons, of the American Surgical Association

and of the Royal College of Surgeons of England. He was a member of the Deutsche Gesellschaft für Chirurgie and of the Société de Chirurgie de Paris. In 1913 he was president of the American Medical Association and of the Clinical Congress of Surgeons of North America.

In 1915 he went to Europe in charge of an American hospital unit serving with the British Army Medical Corps in France. In 1916 he received, from Pope Benedict, knighthood in the Order of St. Gregory the Great. During the last four years of his life he issued the "Surgical Clinics" representing his work at the Mercy Hospital, which have been regularly reviewed in the JOURNAL. Dr. Murphy is survived by his widow.

Dr. Samuel J. Mixer of Boston, at the time of Dr. Murphy's death, gave the following personal estimate of his work and character.

"The death of Dr. John B. Murphy of Chicago, means a great loss to the surgical profession and to the world at large. Possessing an original and active mind, combined with great industry and mechanical and manual dexterity, he has added much to our surgical knowledge and given us new methods of fighting disease and suffering.

"As a writer he was prolific and convincing; as a speaker incisive and enthusiastic. A prominent figure at the meetings of the leading surgical societies, his papers were always listened to with interest and his remarks about the various matters under discussion were pointed and forceful.

"He was an enthusiastic sportsman and thoroughly enjoyed meeting his many friends the world over. He will be mourned and greatly missed."

Soon after Dr. Murphy's death there was incorporated in Illinois, the John B. Murphy Memorial Association, consisting of Drs. William A. Evans, James E. Keefe, Allan B. Kanavel, Frank H. Martin and Frank Crozier. It is the purpose of this Association to raise the sum of \$500,000 as a permanent memorial to Dr. Murphy for the scientific and ethical advancement of surgery.

### Miscellany.

#### THE DOTEN BILL (HOUSE NO. 1015).

An act to establish a System of Insurance to provide Benefits for Employees in Case of Death, Sickness and Accident.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same as follows:

#### PART I.

**DEFINITIONS AND PERSONS INSURED.—SECTION 1.** Recognizing that it is necessary to provide proper care for employees during sickness and pecuniary



support for themselves and their families during periods of inability to work on account of sickness in order to prevent the spread of disease and to protect the health of the subjects of the commonwealth, and recognizing the part which modern industrial and social conditions have in causing sickness among wage-earners, the general court judges compulsory insurance against sickness to be for the good and welfare of this commonwealth and of the subjects of the same.

**Definitions.**—SECTION 2. When used in this act:—

"Commission" means the social insurance commission.

"Association" means a local health or local trade health association, as the case may be.

"Society" means an approved society.

"Carrier" means the society or association which carries the insurance.

"Insurance" means health insurance under this act.

"Disability" means inability to pursue the usual gainful occupation.

"Employer" means a person, partnership, association, corporation, the legal representatives of a deceased employer, or the receiver or trustee of a person, partnership, association or corporation and the state or a municipal corporation or other political division thereof.

"Home-workers" are persons to whom articles or materials are given out to be made up, cleaned, altered, ornamented, finished or repaired, or adapted for sale, in the worker's own home, or on premises not under the control or management of the employer.

"Wages" and "earnings" shall include actual expenditures for or reasonable value of board, rent, housing and similar advantages given employees by the employer and gratuities received in the course of the employment from others than the employer and both these advantages and gratuities shall be added to the actual expenditure of the employer for wages for the purpose of computing his payments under section four of Part III. of this act.

**Compulsory Insurance.**—SECTION 3. Every person employed in the commonwealth for compensation not in excess of one hundred dollars a month, unless exempted under section four of this act, shall be insured in an association or society as provided in this act.

**Persons Exempted.**—SECTION 4. The following persons shall be exempt from the provisions of this act:

Employees of the United States.

Employees of the commonwealth or of municipalities for whom provision in time of sickness is already made through legally authorized means which in the opinion of the commission is satisfactory.

Inmates of charitable or reformatory institutions when employed for the purposes of the institution, with or without maintenance, if provision for maintenance and medical attendance during sickness is made.

Casual employees not employed for the purpose of the employer's trade or business.

Members of the family of the employer who are not paid money wages.

The commission may exempt home-workers, who, owing to the irregularity of their work or other circumstances connected with their work cannot for administrative reasons be included in the system.

**Voluntary Insurance.**—SECTION 5. Self-employed persons whose earnings do not exceed one hundred dollars a month on an average; persons formerly compulsorily insured who, within one year from the date on which they cease to be insured, apply for voluntary insurance; members of the family of the employer who work in his establishment without wages, may insure themselves voluntarily in the local health or local trade health associations of the locality in which they live and of the trade at which they are employed, subject to the conditions of this act.

## PART II.

**Cases in which Benefits paid.**—SECTION 1. Benefits shall be paid for any sickness or accident or death not covered by workmen's compensation.

**Minimum Benefits.**—SECTION 2. Every carrier must provide for its insured members as minimum benefits:—

Medical, surgical and nursing attendance.

Medicines and surgical supplies.

Cash benefits.

Funeral benefits.

**Medical, Surgical and Nursing Attendance.**—SECTION 3. All necessary medical, surgical and nursing attendance and treatment shall be furnished by the carrier from the first day of sickness during the continuance of sickness but not to exceed twenty-six weeks of disability in any consecutive twelve months. This shall include medical, surgical and obstetrical aid to insured women during confinement. In case the carrier is unable to furnish the benefit provided for in this section, it must pay the cost of such service actually rendered by competent persons at a rate approved by the commission.

**Medical Service.**—SECTION 4. The carriers, subject to the approval of the commission, shall make organized provision for medical, surgical and nursing aid by duly qualified physicians, surgeons and nurses or through institutions or associations of physicians, surgeons and nurses, as required by this act.

**Medical and Surgical Supplies.**—SECTION 5. Insured persons shall be supplied with all necessary medicines, surgical supplies, dressings, eyeglasses, trusses, crutches and similar appliances prescribed by the physician or surgeon, not to exceed fifty dollars in cost in any one year.

**Hospital Treatment.**—SECTION 6. Hospital or sanatorium treatment and maintenance may be furnished instead of all other benefits (except as provided in section eight), with the consent of the insured member, or that of his family when it is not practicable to obtain his consent. The carrier may demand that such treatment and maintenance be accepted when required by the contagious nature of the disease, or when in the opinion of its medical officer such hospital treatment is imperative for the proper treatment of the disease or for the proper control of the patient. Cash benefit other than to dependents may be discontinued during refusal to submit to hospital treatment. Hospital treatment shall be furnished for the same period as cash benefit. This benefit may be provided in those hospitals with which the associations and societies have made satisfactory financial arrangements which have met the approval of the commission, or in hospitals erected and maintained by the associations and societies with the approval of the commission.

**Cash Benefit.**—SECTION 7. A cash benefit shall be paid beginning with the fourth day of disability on account of any illness, except for disability due to childbearing; it shall equal two thirds (sixty six and two thirds per cent) of the weekly wages of the insured member. It shall be paid only during continuance of disability, and shall not be paid to the same person for a period of over twenty six weeks in any consecutive twelve months.

**Cash Benefit to Dependents.**—SECTION 8. A cash benefit equal to one third of the wages of an insured member receiving hospital treatment and entitled to cash benefit, shall be paid to his wife, dependent husband or children while he is in the hospital.

**Computation of Benefits.**—SECTION 9. For the purpose of computing the cash benefit, weekly wages shall be taken as the earnings during the last six days on which the employee worked full time preceding disability, not including earnings for overtime, unless such overtime is a regular occurrence in the employment; but if this computation would be unfair to the employee, his weekly wages shall be taken as six times his average daily earnings for the days



actually employed at full time during the three months preceding disability. If any association has established wage classes for any of its insured members, the wages fixed for each class shall be taken as the earnings of all members of the class.

*Periods of Payment.*—SECTION 10. Cash benefit shall be paid weekly where possible, and in no case less frequently than semimonthly.

*Funeral Benefit.*—SECTION 11. The carrier shall pay for the actual expenses of the funeral of a deceased insured member, as arranged for by the family or next of kin, or in absence of such by the officers of the fund, up to the amount of fifty dollars. The funeral benefit shall be paid in case of death of a former member while in receipt of sick benefits, or death within six months after discontinuance of sick benefits provided he has not, within those six months, returned to work.

*Benefits from Other Sources.*—SECTION 12. If the insured member be entitled to benefits during sickness from other sources, his cash benefit under this act shall be so reduced that his cash benefits from all sources shall not exceed ninety per cent of his earnings, and the carrier may refuse to pay cash benefit until the insured member has disclosed the amount of cash benefit to which he is entitled from other sources.

*Payment of Damages from Other Sources.*—SECTION 13. In case the insured member, his heirs or assigns are paid damages from another source on account of sickness, accident or death, the carrier shall be entitled to be reimbursed, by the person to whom damages are paid, for the reasonable cost of all benefits given the insured on account of such sickness, accident or death.

*Suspension of Benefits.*—SECTION 14. (1) While the insured person is serving a term in prison or in jail pending trial, (2) while the insured person is in an insane asylum, home for the feeble-minded, or a public institution for invalid or defective persons, he shall not be entitled to benefits.

*Assignments and Exemptions.*—SECTION 15. Claims for benefits under this act shall not be assigned, released or commuted, and shall be exempt from all claims of creditors and from levy, execution and attachment or other remedy for recovery or collection of a debt, which exemption may not be waived. Benefits shall be paid only to the person entitled or on his order.

*Additional Benefits.*—SECTION 16. The carriers may grant the following additional or increased benefits if the commission be satisfied that the income of the carrier is sufficient for the purpose:—

a. Medical, surgical and nursing care and medical and surgical supplies to members of the family of the insured.

b. A cash maternity benefit to insured women.

c. Extension of cash benefit to exceed twenty-six weeks but not to exceed fifty-two weeks.

d. Funeral benefits for members of the family.

e. Increased amount allowed for medical and surgical supplies and appliances.

f. Increase in the period of extended right to benefit.

g. Dental work in addition to extraction, treatment and ordinary fillings, either up to a certain amount per year or by contribution of part of the cost.

*Extension of Right to Benefit.*—SECTION 17. When contributions cease on account of unemployment not due to sickness, right to benefit shall be extended one week if the insured person has paid contributions during six weeks immediately preceding unemployment, and an additional week for each additional six weeks of paid up membership during the preceding twenty-six weeks.

#### PART III.

*Apportionment of Contributions.*—SECTION 1. The full cost of insurance provided by this act, including

contributions to reserve and guarantee funds, shall be borne by employers, employees and the commonwealth in the following proportions: employers, two fifths; employees, two fifths, and the commonwealth one fifth, except as provided in section two.

*Contributions of Low Paid Workers.*—SECTION 2. If the earnings of the insured are less than nine dollars a week, the shares of the employer and employee of the amount paid by them jointly shall be in the proportion indicated as follows:

If earnings are under \$9, but not under \$8, employer, 60%; employees, 40%.

If earnings are under \$8, but not under \$7, employer, 70%; employees, 30%.

If earnings are under \$7, but not under \$6, employer, 80%; employees, 20%.

If earnings are under \$6, but not under \$5, employer, 90%; employees, 10%.

If earnings are under \$5, employer, 100%.

The contribution of the commonwealth shall remain one fifth of the total.

*Amount of Contributions.*—SECTION 3. The amount of the contributions shall be computed so as to be sufficient for the payment of benefits and the expenses of administration of the association and necessary reserves and guarantee funds.

*Payment of Contribution.*—SECTION 4. Every employer must pay to any local health or local trade health association on the date on which he pays his men, or at least monthly, the total contributions due from him and from his employees to such association. He may deduct from the wages paid any employee the share of that employee in the contribution, which shall be in proportion to his wages, but must inform him, in a method to be approved by the commission, of the amount so deducted. Approved societies shall provide by regulation, to be approved by the commission, for the payment of contributions by their members.

*Calculation of Payments.*—SECTION 5. Payment required from the employer by the preceding section shall be based upon his total expenditures for wages and salaries of employees covered by section three of Part I, of this act during the period for which payment is made.

*Rates of Contributions.*—SECTION 6. In associations in which employees in several industries are insured, payments required from employers of such employees may be fixed at different amounts for different industries, according to the degree of sickness hazard in those industries.

*Establishments with Excessive Rate of Sickness.*—SECTION 7. An association shall have the right, subject to the approval of the commission, to increase the rate of contribution of any employer whose establishment shows an excessive rate of sickness, such additional contribution to be payable by the employer without right of deduction from the wages of the employee.

#### PART IV.

*Division of the Commonwealth into Districts.*—SECTION 1. The commission shall, within six months after this act goes into effect, divide the commonwealth into districts, no one of which shall contain less than five thousand persons subject to compulsory insurance.

*Establishment of Associations.*—SECTION 2. Commission shall, before Sept. 1, 1917, hold one or more hearings in each district, notice of which shall be given by advertisement in at least one newspaper published in the district, and by any other method approved by the commission, and shall thereafter determine whether one or more local health associations and one or more trade health associations shall be established in the district. The commission shall then provide in each district for the election of delegates, half of whom shall be elected by employers, half by employees affected, to conventions which



shall have power to adopt constitutions. The expense of the elections and conventions shall be paid by the commonwealth, as expenses of the commission are paid.

**Consolidation or Division of District.**—SECTION 3. The commission at any time, on its own motion or on the petition of the board of directors of any local health or local trade health association, may consolidate two or more districts or detach a territory from one district and annex it to another, or create a new district from parts of several districts or from one district, already in existence, and shall make such disposition of the property of the dissolved association as shall seem to be proper.

**Establishment of Local Trade Health Associations.**—SECTION 4. Employers whose principal places of business are within the same district and employing two hundred and fifty employees in the same trade, or two hundred and fifty employees employed in the same trade by employers whose principal places of business are within the same district, may petition the commission for the formation of a local trade health association, and the commission, after a hearing within the district, which shall be duly advertised and notice of which shall be sent to the boards of directors of the local health and local trade health associations within the district, may authorize the formation of a local trade health association if there be no other local trade health association within the district for the trade, and if the establishment of the new local trade health association will not impair the solvency of the local health association or of any local trade health association in the district.

**Authorization by Commission.**—SECTION 5. No association shall begin business until it is authorized by the commission. The commission shall authorize an association only after approval and filing of its constitution and after the names and addresses of the board of directors elected for the first year have been filed with the commission.

**Powers of Associations.**—SECTION 6. Associations shall be corporations and shall have all the power necessary to carry out their duties under this act, including the power to verify by audit pay rolls of employer members for the purpose of determining contributions for which employer members are liable.

**Constitution of Associations.**—SECTION 7. Subject to the provisions of this act, the constitution of an association shall contain:—

Name of the association and location of its principal office.

If the association is a local trade health association, designation of the trade or trades for which it is created.

Maximum percentages, in each occupation, of total expenditures for wages and salaries as provided in section four of Part III of this act, at which the regular contribution may be fixed; a maximum which shall not exceed three per cent of the total, except with the approval of the commission, and shall in no case exceed five per cent of the total.

Nature and amount of benefits and length of time during which they shall be given.

Manner of election, number, powers, duties and time of meeting of all committees.

Number, powers, duties and time of meeting of the board of directors.

Method of amendment of constitution, and such other provisions as may be directed by the commission.

**Committee of the Association.**—SECTION 8. There shall be a committee of each association, which shall consist of not less than twenty and not more than two hundred members, to be elected in the manner provided in the constitution, one half by and from the employer members of the fund, one half by and from the employee members. The committee shall cause an audit of the accounts of the association to be made each year, and shall pass upon the same and

upon the annual report and budget of the board of directors.

**Employers' Votes.**—SECTION 9. Each employer member shall have as many votes for employer members of the committee as he employs workmen subject to the insurance and members of the association, except that no one employer shall have more than forty per cent. of the total vote, unless otherwise provided in the constitution.

**Board of Directors.**—SECTION 10. The board of directors shall be elected by the committee for a period of one year. All directors must be citizens of the United States, and a majority of them must be residents of this commonwealth. The board shall consist of not less than eight and not more than eighteen directors, one half of whom shall be elected by employer members of the committee, and one half elected by employee members of the committee. No one shall be a member of the committee and a director at the same time. The compensation of members of the board shall not be more than five dollars a day for each day spent upon the business of the fund. The directors shall be reimbursed for any necessary expenses incurred by them as such directors.

**Powers of the Board.**—SECTION 11. The board shall:—

Fill vacancies in its own number for unexpired terms; provided, that only employers' representatives shall vote for employer directors, only employees' representatives for employee directors.

Appoint all officers and employees of the board and fix their salaries, and may delegate to officers or employees the power of appointing subordinate employees and of fixing their salaries.

Elect a president and secretary from their own number.

Make regulations necessary for carrying out the purposes of the association.

Make contracts with physicians, hospitals, pharmacists and any other persons necessary for the business of the association.

Prepare and submit to the committee annually a financial account and a report for the past year and a budget for the ensuing year.

Represent the association and direct and administer its affairs, except as otherwise specified in this chapter.

**Officers' Bonds.**—SECTION 12. All executive and judiciary officers of the associations shall be bonded for amounts to be determined by the board of directors, with the approval of the commission.

**Reserve.**—SECTION 13. Every association shall accumulate a reserve fund. The board of directors shall transfer to such fund one twentieth of the annual income of the association until such fund is equal to one sixth of the total expenditures for the preceding three years. The fund shall be maintained at this level. Any surplus which may accrue from the investment of such fund may be transferred into the general account of the association.

**Membership in Association.**—SECTION 14. Every person subject to insurance shall be an insured member of the local trade health association of the trade at which and in the district in which he is employed; or if there be no such association, of a local health association of such district; provided, that while he is a member of an approved society he shall be excluded by the board of directors from membership in an association. The commission shall provide by regulation for the case of persons regularly occupied at one trade, but temporarily employed at another. Membership in local health or local trade health associations shall cease as soon as the insured becomes a member of another local health or local trade health association. Any employer shall be an employer member of all associations of which any of his employees are members.



**Voluntary Insurance.**—SECTION 15. A person entitled to voluntary insurance must be admitted on application to membership in the local trade health association of his trade in the district in which he is employed, or if there be no such association, then in a local health association of such district; provided, that any association may prohibit by regulation the admission to voluntary insurance of a person who has not passed a satisfactory medical examination by its medical officers, and that the application for admission be subject to the same condition as an application for insurance. The contribution of the voluntary member shall be equal to the contribution required of the employer and employee for a compulsory member of the same trade and earnings.

**Loss of Voluntary Membership.**—SECTION 16. A person voluntarily insured shall lose his membership if he acquire membership, either voluntary or compulsory, in another association or society, or if he be in arrears for one month in the payment of his contributions, unless this period is extended by the association.

**Fines and Penalties.**—SECTION 17. Associations may fine their employer and insured members and suspend insured members from benefit for violation of their rules or regulations or for fraudulent representations made with the intent of securing or aiding another to secure benefits, in accordance with rules approved by the commission providing for and limiting such fines or suspensions. If an employer fails or refuses to pay any contribution due to the carrier under this act, the carrier to whom the contribution is due may recover the whole sum with interest at six per cent by suit in a court of competent jurisdiction, and the employer shall not be entitled to deduct any part of such sum from the wages of his employee or employees.

**Approved Societies.**—SECTION 18. A labor union, benevolent or fraternal society, or an establishment society, shall be approved by the commission only after hearing the local health or local trade health associations affected and only if:—

It is not carried on for profit, but reasonable salaries paid officials shall not be considered profit.

It is under the absolute control of the insured members in so far as the insurance regulated by this law is affected, except that the employer may appoint one half of the governing body of an establishment society.

It shall satisfy the commission that it is in a sound financial condition.

It grants at least the minimum benefits provided in this act.

It has a membership of at least five hundred persons insured for at least the minimum benefits provided under this act or their equivalent, except that in the case of establishment societies in which the employer satisfactorily guarantees the payment of benefits, the number of members may be fixed by the commission.

Its operation will not, in the opinion of the commission, endanger the existence of any local health or local trade health association.

In case of an establishment society, a majority of the employees subject to insurance request approval, and the employer's contribution be at least equal to that of all the employees.

The approval of the commission may be withdrawn at any time upon its finding, after hearing the society affected, that any of the required conditions are no longer satisfied. The commission may, after a hearing, permit an establishment society to accept, on conditions satisfactory to the commission, as members, all persons subject to insurance in its district.

**Employers' Contributions.**—SECTION 19. The commission shall assess upon every employer, any of whose employees are insured in labor union, benevolent or fraternal societies, a sum equivalent to the employer's contributions had such employees been

members of associations. This sum shall be paid in monthly installments into the guarantee fund established by the commission.

**Contributions of the Commonwealth.**—SECTION 20. The commonwealth shall contribute to every approved society one fifth of its total expense for health insurance under this act, subject to the provisions of section nine of Part V of this act.

**Organization of Wage Groups Permitted.**—SECTION 21. An insurance carrier may, with the approval of the commission, divide the members entitled to benefits into wage groups for the purpose of administering cash benefits.

**Power to Fix Wages.**—SECTION 22. Any carrier may fix the average wages or may fix the average gratuities received in any employment or branch thereof, and on the approval of the commission, such amounts shall be conclusive on all its members, except that the average wages shall not apply to section four of Part III of this act.

**Health Insurance Union.**—SECTION 23. Two or more health insurance carriers may combine for the administration of the medical benefit, subject to the approval of the commission. The commission may, after notice to and hearing of the parties in interest, withdraw its approval and dissolve the union, making such disposition of its property as may seem to it in the best interests of the insured.

#### PART V. COMMISSION.

**State Social Insurance Commission.**—SECTION 1. A state social insurance commission is hereby created, consisting of three commissioners, to be appointed by the governor, one of whom shall be designated by the governor as chairman. The term of office of members of the commission shall be six years, except that the first members thereof shall be appointed for such terms that the term of one member shall expire on January 1, 1918; one on January 1, 1920; and one on January 1, 1922. Each commissioner shall devote his entire time to the duties of his office, and shall not hold any position of trust or profit, or engage in any occupation or business interfering or inconsistent with his duties as such commissioner, or serve on or under any committee of a political party. The commission shall have an official seal, which shall be judicially noticed.

**Secretary.**—SECTION 2. The commission shall appoint and may remove a secretary, at an annual salary of three thousand six hundred dollars. The secretary shall perform such duties in connection with the meetings of the commission, and its investigations, hearings and the preparation of rules and regulations under the provisions of this act, as the commission may prescribe.

**Officers and Employees.**—SECTION 3. The commission may appoint such officers, other assistants and employees as may be necessary for the exercise of its power and the performance of its duties under the provisions of this act, all of whom shall be in the competitive class of the classified civil service; and the commission shall prescribe their duties and fix their salaries, which shall not exceed in the aggregate the amount annually appropriated by the legislature for that purpose.

**Salaries and Expenses.**—SECTION 4. The chairman of the commission shall receive an annual salary of \$4500, and each other commissioner an annual salary of \$4000. The commissioners and their subordinates shall be entitled to their actual and necessary expenses while traveling on the business of the commission. The salaries and compensation of the subordinates, and all other expenses of the commission shall be paid out of the state treasury upon vouchers signed by the chairman or one of the commissioners designated by him for that purpose.

**Office.**—SECTION 5. The commission shall have its main office in the capitol of the commonwealth, and



may establish and maintain branch offices in other cities of the commonwealth as it may deem advisable. Branch offices shall, subject to the supervision and direction of the commission, be in immediate charge of such officials or employees as it shall designate.

**Powers of Individual Commissioners.**—SECTION 6. Any investigation, inquiry or hearing which the commission is authorized to hold or undertake may be held or undertaken by or before any commissioner, and the award, decision or order of a commissioner, when approved and confirmed by the commission and ordered filed in its office, shall be deemed to be the award, decision, or order of the commission. Each commissioner shall, for the purpose of this act, have power to administer oaths, certify to official acts, take depositions, issue subpoenas, and compel the attendance of witnesses and the production of books, accounts, papers, records, documents and testimony.

**Powers of Commission.**—SECTION 7. The commission may adopt all reasonable rules and regulations, and do all things necessary to put into effect the provisions of this act.

**Payment of Commonwealth Contributions.**—SECTION 9.—The commission shall estimate the commonwealth contribution annually before the first day of January of each year and shall, before that date, apportion it among the carriers in proportion to their estimated expenditures for the purposes of the act during the year, and shall notify the commonwealth treasurer of the sum to be paid on March 31, June 30, September 30, and December 31 of the current year to each carrier. The treasurer shall pay the amount out of the unexpended balance of any appropriation in his hands for the purpose.

**Guarantee Fund.**—SECTION 9. The commission shall reserve ten per cent of the contributions of the commonwealth to the carriers and pay it into a fund to be known as the guarantee fund, from which it may contribute for the relief of any carrier, on the application of its board of directors after investigation by the commission. A contribution shall be made only where, in the judgment of the commission, the necessity arises from epidemic, catastrophe or other unusual conditions, and shall never be made where, in the opinion of the commission, the deficit is due to failure or refusal of the directors to levy proper rates of contributions. When, and so long as, in the opinion of the commission the guarantee fund is sufficient, the commission shall make no reservation for this purpose.

**Commonwealth Treasurer Custodian of Fund.**—SECTION 10. The commonwealth treasurer shall be the custodian of the commonwealth guarantee fund, and all disbursements therefrom shall be paid by him upon vouchers authorized by the commission and signed by the chairman or another member designated by him in writing. The commonwealth treasurer shall give a separate and additional bond in an amount to be fixed by the governor and with securities approved by the commonwealth comptroller conditioned for the faithful performance of his duty as custodian of the guarantee fund. The commonwealth treasurer may deposit any portion of the fund not needed for immediate use, in the manner and subject to all the provisions of law respecting the deposit of other commonwealth funds by him. Interest earned by such portion of the guarantee fund deposited by the commonwealth treasurer shall be collected by him and placed to the credit of the fund.

**Report of Commission.**—SECTION 11. Annually, on or before the first day of February, the commission shall make a report to the governor, which he shall lay before the legislature, which shall include a statement of the apportionment, the commonwealth contribution, statistics of sickness experience under this act, a detailed statement of the expenses of the commission, the condition of the commonwealth guarantee fund, together with any other matter which the

commission deems proper to report, including any recommendations it may desire to make.

**Social Insurance Council.**—SECTION 12. The social insurance council shall consist of twelve members, six of whom shall be elected by employer directors and six by employee directors of the local health and local trade health associations; their term of office shall be two years, except that in the first election three of the employer and three of the employee members of the council shall be elected for one year; they shall receive a compensation of five dollars a day for each day spent on the business of the council, and shall be reimbursed for reasonable expenses incurred in connection with such business, to be paid as other expenses of the commission are paid.

**Officers of Council.**—SECTION 13. The council shall elect a president from its own number; the secretary of the commission shall act as the secretary of the council.

**Meetings of Council.**—SECTION 14. The council shall meet during the first week of January, of April, of July, of September, each year. Special meetings shall be called by the president on the request of at least five members of the council or of two members of the commission, at any time.

**Duties of Council.**—SECTION 15. The annual report and recommendations of the commission shall be laid before the January meeting of the council before transmission to the governor, and the council may approve them or make a separate report and recommendations to the governor. All general regulations proposed by the commission shall be laid before the council at a regular or special meeting for discussion before final adoption, except in cases of urgency, to be determined by the commission, and in this case the regulation shall be laid before the next regular meeting of the council or a special meeting called for the purpose.

**Settlement of Disputes.**—SECTION 16. All disputes arising under the act shall be determined by the social insurance commission either on appeal from the proper authority or from the carrier, or, in case of disputes between carriers, by original proceedings. The commission may assign any dispute for hearing and determination to a dispute committee, composed of one employer and one employee member of the council, and a member of the commission, as chairman, the members of the council to serve in turn on the dispute committee for periods of one month; either party may appeal from the decision of the dispute committee to the commission within thirty days from the date of rendering the decision.

**Suits at Law.**—SECTION 17. Suits shall not be brought in any court on any matter on which an appeal is allowed to the commission until after a decision by the commission, or of a dispute committee, and the statutes of limitations shall not begin to run in such cases until after decision of the commission or dispute committee is filed.

## PART VI.

### MISCELLANEOUS PROVISIONS.

**Limitation of Claims.**—SECTION 1. No claim for benefit shall be valid unless made to the board of directors of the proper carrier within one year from the time when the benefit was due.

**Limitation of Claims for Contributions.**—SECTION 2. No claim of a carrier for contribution shall be valid unless suit is brought thereon in the proper court within one year from the time when it was due.

**Disclosure Prohibited.**—SECTION 3. Information acquired by the commission or any association, or any of their officers or employees, from employers or employees pursuant to this chapter shall not be opened to public inspection, and any officer or employee of the commission who, without authority of the commission or pursuant to its rules, or a ther-



wise required by law, shall disclose the same, shall be guilty of a misdemeanor.

**Technical Rules of Evidence or Procedure Not Required.**—Section 4. The commission or a commissioner or deputy commissioner or appeal committee in making an investigation or inquiry or conducting a hearing shall not be bound by common law or statutory rules of evidence or by technical or formal rules of procedure, except as provided by this chapter; but may make such investigation or inquiry or conduct such hearing in such manner as to ascertain the substantial rights of the parties.

**When to Take Effect.**—Section 5. This chapter shall take effect immediately, except that the provisions as to the payment of contributions shall not take effect until January 1, 1917, and the first payment of contributions by the state shall not be made until March 31, 1917; the provisions as to the medical, surgical and nursing benefit and the medicine and supply benefit shall not take effect until April 1, 1917, and the provisions as to the other benefits shall not take effect until July 1, 1917; *provided*, that if a carrier is authorized after January 1, 1917, the provision as to the medical, surgical and nursing and the medicine and supply benefits shall not take effect until three months, and the provisions as to other benefits shall not take effect until six months, after authorization.

**Tax Exemption.**—Section 6. The property of the association shall be free from taxation for all purposes.

#### NOTICE.

**BOSTON CITY HOSPITAL.**—Until further notice, Saturday will be the public operating day at the Boston City Hospital. Operations will commence at 10 a.m., and will be performed by members of the surgical staff on active duty. Operative clinics of individual services will be continued on days to be announced later. In future the operating day of the second surgical service will be on Friday, instead of on Saturday, as in the past. Drs. Lund, Hubbard and Cunningham will operate at 10 a.m.

#### SOCIETY NOTICE.

**THE MASSACHUSETTS THERAPEUTIC MASSAGE ASSOCIATION.**—The next meeting will be held at the Hotel Brunswick, at 7.45 p.m., Thursday, December 14, 1916. Dr. Frank C. Richardson, professor of diseases of the Nervous System, Boston University Medical School, will address the Society on "Dysglandular Syndromes—Conditions of Ill Health from Disturbances of Glands of Internal Secretions."

Members of the medical profession invited.

Please be prompt and thus show your appreciation.

DOUGLAS GRAHAM, M.D., *President*,  
MRS. MABEL F. WALKER, *Secretary*.

#### APPOINTMENTS.

**UNIVERSITY OF GHEENT.**—Dr. J. Versluis, who, since 1907, has been professor of zoology and comparative anatomy at the University of Giessen, has been appointed to the same chair in the new Flemish University of Ghent.

**UNIVERSITY OF NEBRASKA.**—Dr. H. E. Eggers has been appointed professor of pathology and bacteriology; Dr. Amos W. Peters, assistant professor of biochemistry; and Dr. John P. Myers, instructor in bacteriology at the Medical School of the University of Nebraska, Omaha.

#### RECENT DEATHS.

**DR. JOHN A. MCCORKLE**, who died recently at Brooklyn, N. Y., was born at Lordstown, Ohio, in 1847. He received the degree of M.D. in 1873 from the University of Michigan, and later studied at the Long Island College Hospital Medical School. In 1875 he was appointed chemist to the Brooklyn Board of Health. In 1880 he was appointed professor of materia medica at the Long Island College Hospital Medical School, where, in 1886, he became professor of the theory and practice of medicine and of clinical medicine, and in 1904, president of the institution. His specialty was in diseases of the heart and lungs, and he was the author of several books and many papers on these subjects. He was for many years consulting physician of the King's County Hospital, the Norwegian Hospital, the Jewish Hospital, and the St. John's Hospital. He was a member of the American Medical Association, the New York Academy of Medicine, the King's County Medical Society, the Associated Physicians of Long Island, the Brooklyn Pathological Society, and the Brooklyn Society of Internal Medicine. He was not married.

**DR. LOUISE C. PURINGTON**, who died recently at Dorchester, Mass., was born in Madison, N. Y., on July 3, 1845. She received the degree of M.D. from the Hahnemann Medical College in Chicago in 1874, and had practised her profession in Massachusetts since that time.

**DR. WILLIAM MANLY SULLIVAN**, who died recently at North Adams, Mass., was a native of that city. He graduated from the dental school of the University of Pennsylvania in 1904, and began the practice of his profession in North Adams. In 1915 he was appointed a member of the Massachusetts State Board of Registration in Dentistry. He was a member of the Massachusetts and Berkshire Dental Societies and of the North Berkshire Medical Society. He is survived by his widow and two children.

**DR. LOUIS McLAIN TIFFANY**, who died of cardiac disease on October 23, in Mount Custis, Accomac County, Virginia, was born in 1844. He obtained his academic education at the University of Cambridge, England, and received his medical degree from the University of Maryland. He was for many years professor, and finally emeritus professor, of medicine at the University of Maryland and surgeon and consulting surgeon for the Johns Hopkins Hospital, Baltimore.

**DR. HARRY ALBERT TUTTLE**, who died on October 30, at Derry, N. H., was born in Boston in 1875. He graduated from the Harvard Veterinary School in 1898, and since that time had practised his profession in and about Boston. He is survived by his widow.

**DR. WILLIAM UNDERWOOD TUTTLE**, brother of Dr. Harry Tuttle, died on November 10 of pneumonia, at Jamaica Plain, Mass. He was born at Hyde Park, Mass., in 1878, and graduated from the Harvard Veterinary School in 1901. He was not married.

**DR. JULIUS H. EICHBERG**, who died on October 31, 1916, was for many years professor of materia medica in the College of Medicine of the University of Cincinnati.

**DR. JAMES O. GREEN**, who died on November 24, at Long Branch, N. J., was born in 1839. He received the degree of A.B. from Princeton University in 1861, and that of M.D. from Bellevue Medical College in New York in 1864. He had practised surgery for his entire professional career in New Jersey. He is survived by his widow and three daughters.



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### Address.

## THE HISTORY OF THE GROWTH OF THE ANTI-TUBERCULOSIS MOVEMENT IN MASSACHUSETTS, AND THE LESSONS TO BE LEARNED THEREFROM.\*

BY VINCENT Y. BOWDITCH, M.D., BOSTON.

IN appearing before you today at the invitation of the founders of this school, I find myself rather at a loss in trying to voice the deep feeling natural to any one upon such an occasion as this. Gratitude to those who have thus honored me by placing me upon the list of those who are to appear in this, the first season of the school; reverence for the memory of the great and good man whose name it bears; a sense of sadness that the wonderful personality which we all loved and leaned upon for sympathy and guidance is now only a memory.—a memory, however, which must always be an inspiration for patient, strong, and unselfish endeavor to alleviate the suffering of others; finally, the earnest desire that I may say or do something worthy of such an occasion to help you from my own experience:—all these thoughts crowd upon me as I stand before you today in the midst of sacred associations which will ever be coupled with the names of Saranac Lake and Edward Livingston Trudeau.

I have been asked to give you the history of the growth of the tuberculosis movement in

Massachusetts, and something of my own experience therein.

In tracing the first active steps taken in our state for the closer study of tuberculosis, it is inevitable that the treatment of the subject should partake of something of a personal nature. I trust that in recording certain facts, I may not be accused of too great filial zeal in mentioning the special work of my father, the late Dr. Henry Ingersoll Bowditch; and I hope, moreover, that I may not be thought egotistical if I bring before you some of my own experiences in these directions during the last twenty-five years while following out and enlarging the scope of certain ideas which were constantly advocated by my father.

Under the tutelage of the great Louis in Paris, in the early thirties of the past century, he imbibed the teachings of Laennec in stethoscopic examination of the heart and lungs. Returning to America, already deeply interested in diseases of the chest, he was pronounced by his contemporaries to be the fitting successor of the then famous Boston physician, Dr. James Jackson, in this special line of work. Early in the fifties, my father began to make laborious investigations, as to the causative factors of pulmonary tuberculosis; at that time existing under the less scientific name of "consumption."

Patient research through the various sections of the state by closely questioning the medical men in every direction, revealed the interesting and important fact that continued residence upon a damp soil was apparently, for some reason possibly not satisfactorily explained, a potent factor in the production of the disease.

\* Delivered at a meeting of the Trudeau School of Tuberculosis, Saranac Lake, N. Y., June 21, 1916.



This work covered a period of eight years, and in 1862 he gave the result of his investigations to the Massachusetts Medical Society, the work being published at that time under the title of "Soil Moisture as a Cause of Consumption," etc. This work was received with acclamation by the Massachusetts Medical Society. A perusal of the pamphlet with its carefully prepared maps and other data convinces one of the immense amount of labor given to the work, and of the apparent soundness of the deductions drawn from his researches.

As an interesting coincidence, Dr. Buchanan of London, almost at the same time published the results of his investigations in England, with practically the same conclusions as those of my father, neither having had previously any knowledge of the other's work. This was twenty years before Koch gave to the world (in 1882) the discovery of the specific cause of tuberculosis: the *bacillus tuberculosis*. Although this discovery gave an unprecedented knowledge of the etiology of the disease, it in no way weakened the importance of the work previously done, for although our modern conception of tuberculosis has been greatly modified by the discovery of the bacillus, I think it may be justly said that clinically we recognize, or should recognize, the fact that although other factors may be equally favorable to the growth of the bacillus, like crowded, ill-ventilated workshops or houses, yet people who live in swampy, low-lying regions seem to be more prone to ill-health in various forms than those who reside on drier, more porous soil, regardless of mere elevation. That such conditions of previous ill-health should be one cause of lessened power of resistance to infection from tuberculosis seems, at least, a plausible explanation of the fact discovered simultaneously by two investigators. Possibly the true reason may never be proved, but we can certainly be guided by what experience has shown to be a clinical fact, and I bring this point up now because, with our present knowledge of specific causes of disease, we are apt to forget the valuable and trustworthy experiences of earlier times.

About the time of which I speak, at Görbersdorf in the mountains of Silesia, the famous Brehmer, who may be called the father of the modern sanatorium treatment for tuberculosis, was beginning to teach the good results upon patients of a properly regulated life in the open air: methods which were at that time ridiculed and condemned by most of the profession, which was steeped in theories involving ideas quite contrary to those taught by him. It is needless to dwell now upon his long and patient work, and the favorable results obtained by him, which have served as a model for succeeding generations and hosts of followers.

Whether at that time Brehmer's ideas had crossed the ocean to special individuals or not, it would be impossible to say today; but an in-

teresting clinical fact which has but recently been brought vividly to my attention, makes it evident that at least one man, over sixty years ago, had prophesied that fresh-air treatment, carried out to a very marked degree, was destined to supplant the methods of that time when patients were shielded not only from cold but even from fresh air; coddled and protected at home; often sent to warm, relaxing climates, and dosed *ad nauseam* with cod-liver oil, whiskey, and other vaunted remedies.

Among my earliest recollections are my father's vehement protests against the close, confined atmosphere of sickrooms. Insistence upon removal of air-tight stoves as the arch enemy of good ventilation, the importance of open windows, of dry cellars, the cutting down of trees which shaded houses too heavily in the summer, and the avoidance of the excessive use of medicines, were all lessons imbibed early and unconsciously by me from their constant reiteration, although I do not recall the suggestion then of our more modern drastic methods, which at that time would have doubtless been regarded as little less than insane by most observers.

In a letter received recently from a gentleman over ninety years of age but still in vigorous health,—a patient who consulted my father in 1857 (nearly sixty years ago) because of incipient tuberculosis,—I have proof that the modern methods had at least entered my father's mind from whatever source. I will not apologize for offering you something of a distinctly personal nature. In my opinion, such examples furnish more vivid proof of the correctness of principles or ideas than pages of mere suggestions, and I should like to impart to you some of the pleasure and profit that I personally received from the words which I now quote, coming as they did unexpectedly.

March 8, 1916.

Vincent Y. Bowditch, M.D.

My dear Sir:—In a conversation, last night, with your friend and classmate, Dr. X., I spoke of a distinct service your father rendered me in the late summer of 1857. After Dr. X. had heard some of my experiences in carrying out your father's directions and the results that followed, he asked me, "Did you ever write and thank him for that service?" I replied, "I did not think of it then, in my confusion, but I have often since, and I should greatly enjoy meeting a son of his and of telling him the happy result of that two hours' consultation, which was my perfect restoration to health in twelve months from well-defined tuberculosis."

Then Dr. X. told me of his pleasant relations with you, gave me your address, and I am greatly enjoying paying a debt, *long past due*, through you to your father's memory.

In that interview, your father strongly disapproved of my going to Key West, as I had proposed, and as strongly expressed his firm conviction that an "out-of-door life on a Minnesota ranch" would speedily bring relief from my ailment. I recall vividly the suppressed vigor with



which he said, "Avoid drugs, hotels, hot stoves, plastered rooms; you can get all these here in Boston and die; yet if you and your young wife have the pluck to go where and do as I tell you, you can live, and live in good health and in a community of immense promise." He walked with me to the door of his office, and patting me smartly on my shoulder said, "Do not fear this cold-air treatment; it is the coming cure for your trouble."

I went, and heartened under his compelling words, I proved his prediction true. Dr. X. seemed to enjoy my narrative of the many severe and cruel tests brought to me and my young wife and child in testing out that "outdoor cure" in a record-breaking Minnesota winter, but the great joy of a perfect recovery outmatched them all.

I can assure you your father's memory has been kept green through all these years. . .

Very sincerely,

Note the last remark made to the patient as he left the office. It has the interesting quality of prophecy in it to us now, surrounded as we are by the frequent proofs of the correctness of those who in recent years at least have believed in and seen the gratifying results obtained in thousands of cases from fresh-air treatment pushed to its limit, and who have felt the stimulus of hope as contrasted with the former heart-sickening sense of depression whenever the word "tuberculosis" or "consumption" happened to be mentioned to the unfortunate victim or to those dear to him.

This point should be emphasized strongly, for, in the midst of doubts and perplexities of practice at the present time, and with the often discouraging attempts to bring tuberculous patients back to health, it is well for those of the younger generation to know the utter hopelessness that often pervaded the minds of patients, their friends, and even the physicians themselves, before more modern methods were begun. I feel, now, grateful for my own experiences of former years, for it gives me the greater courage in speaking of the vastly improved methods of dealing with tuberculous patients of today, and I say this in the face of the statements of a few pessimists who decline to believe that the undoubted decrease in the mortality from tuberculosis has any connection with the modern methods of treatment and who are inclined to believe that our efforts are fruitless in that direction.

Just here, however, it would be well to speak of the necessity for conservatism in all enthusiasm for new projects and ideas. It was said of the great Pasteur that he was continually clipping the wings of his transcendent imagination lest it should lead him astray while lifting him to regions higher than before. He rigidly tested his conclusions before submitting them to final proofs and cautioned others to do the same, for he saw the danger of claiming too much lest discredit should fall upon an idea which, while marking a distinct advance, was possibly far from perfect.

The growth of the idea of sanatorium treatment for tuberculosis is a marked example of this. Its earliest advocates, who knew how much could be accomplished by it and who continually urged this method, knew perfectly well that it was not a panacea for every case, and continually urged conservatism even in their enthusiasm for it. Many over-zealous workers, however, among the profession and the laity, deceived by the favorable results, sometimes only temporarily obtained by sanatorium treatment, jumped at conclusions, and even rushed into print with extravagant claims in spite of the protests of those who knew better. The inevitable result followed: a reaction from unhealthy enthusiasm over a new idea and a corresponding swing of the pendulum to an equally extravagant degree in the other direction, with detriment and injury—fortunately, however, not permanent—to a cause which had been proven of great benefit to humanity.

Soberer judgment in recent years, however, has brought this subject back to a more normal point, and to those who know that tuberculosis, to be overcome, must be attacked by every method known to science, there is now no shadow of doubt that one of the most important of these is the establishment of sanatoria for suitable cases, where, under favorable conditions, thousands of patients may be restored to health who in former years would have run the usual fatal course, unaided and hopeless.

Trudeau, as most of you know, founded his now famous institution in 1885, as the first of its kind in America. Encouraged by his example, and having in mind the often expressed wish of my father in former years, that he had some place in the country near Boston where he could send tuberculous patients with benefit, I soon afterwards conceived the idea of establishing a small institution not far from my native city for this purpose, to be used for those who could not afford to seek distant health resorts. At that time, it was thought to be a *sine qua non* of recovery from tuberculosis that high altitudes far from the sea should be sought. The idea that it could be cured at a low altitude not far from the sea, and in the harsh inclement New England climate was regarded by many as little short of chimerical.

In spite of many discouragements, however, in 1889, money was obtained from interested people, and a small farm was bought in Sharon, Massachusetts, eighteen miles from Boston, situated on the watershed between Providence and Boston, only 250 feet above sea level, on gravelly soil and abounding in pine woods. With a sufficient sum of money assured to begin with, a small but suitable building for eight women patients was erected and on February 9, 1891, just twenty-five years ago, the Sharon Sanatorium opened its doors as a semi-charitable institution, the first of its kind in New England, and [up to that time the only one in existence for



this special purpose under the above-mentioned conditions of altitude and climate.

Begun largely as an experiment hitherto untried, facing the natural doubt in the minds of many of the medical profession and others as to its ultimate success, the work naturally involved close observation combined with keen anxiety as to the outcome. It was not long, however, before favorable results in a fairly large percentage of early cases began to impress those who doubted at first. By continued observation in after years and by improved methods of treatment, the favorable results increased in number, finally leaving no doubt as to the success of the experiment begun years before. Since 1891, the sanatorium has steadily increased its capacity, and in this twenty-fifth year of its existence its work will be enlarged and broadened by the establishment of a combined school and sanatorium for tuberculous children. As each year goes by and favorable reports still come from those who years ago left the sanatorium with apparently renewed health, the success of the experiment is shown more and more satisfactorily. The fact, moreover, that this and every other sanatorium of similar nature, if properly regulated, acts as a school of hygiene for the patients and through them to the communities in which they live, I believe to be the most important feature of such work; for in bringing our patients back to health, we also teach others through them how to keep well; a potent factor in the cause of preventive medicine and one often not sufficiently recognized in considerations of the subject.

Dr. Alfred Worcester, of Waltham, Massachusetts, who had watched the work at Sharon in its early years with keen interest, was appointed a trustee of a proposed new state hospital for advanced consumptives, afterwards opened at Rutland, Massachusetts. Largely through his influence and in consequence of the favorable results noted at Sharon, as stated in the first report of the Rutland institution, the purpose of the new hospital was changed to that of a sanatorium for the treatment of early and hopeful cases of tuberculosis. In October, 1898, this institution was opened; the first state sanatorium of this nature in the United States, and to which I had the privilege of being attending physician for the first eight years of its existence.

From this time on, the anti-tuberculosis movement seemed to go forward by leaps and strides, spreading over the country. In 1898, Dr. Charles Millet of Brockton, Massachusetts, began a series of experiments with what may be called the first examples of "home treatment" among poor people, most of them mill and factory operatives who were dependent upon their own efforts for support. His admirable work in teaching his poor patients to build small, open sleeping balconies at their homes, to be utilized at night, was really the beginning in substantial measure of similar, but more elabor-

ate methods in later years under the supervision of Dr. Joseph H. Pratt in Boston, and afterward his able co-worker, Dr. Nathaniel K. Wood, both of whom have published the favorable results obtained from so-called "church classes for tuberculous patients" under the charge of the Emmanuel and Arlington Street churches respectively. In 1900, Dr. Millet established in his ancestral home in East Bridgewater a sanatorium for well-to-do patients, founded upon the same principles as those of its predecessors, and within the last decade, two private sanatoria for the more favored class of patients have been established at Rutland, Mass., by Drs. Bayard T. Crane and George N. Lapham.

In 1904 the first attempt was made for dispensary supervision of tuberculous patients in Boston at the Boston Dispensary, under the guidance of Dr. E. O. Otis. This was founded upon the principle first suggested by Dr. R. W. Philip, now Sir Robert W. Philip, of Edinburgh, and of Prof. Calmette of France, who first gave their methods to the medical world in the eighties. By these means, the plan of caring for tuberculous patients at their own homes, and in the out-patient departments, was established. This plan, which was adopted so successfully by Philip and Calmette, never was developed to a large extent here, however, until recent years. It has been greatly elaborated since the establishment of the Boston (Mattapan) Hospital for Consumptives, founded in 1906, with its large out-patient clinic, situated in the heart of Boston and under the central control of the municipal authorities and the medical staff. Not long after the establishment and growing success of the Rutland institution, it was my strong personal conviction, and that of others, that in order to work towards the greater control of tuberculosis, hospitals for the more advanced cases must be erected throughout the state, and a strong sentiment arose in favor of the plan. Public interest had been steadily aroused, and, in 1907, nine years after the opening of the Rutland sanatorium, the erection of the large hospitals, now at North Reading, Lakeville, and Westfield, was authorized by our legislature. At first, these partook, as intended, of the nature of hospitals for very ill patients, but with the steady growth of the anti-tuberculosis movement and the realization that towns and cities should erect their own local hospitals for such cases, the character of these last-mentioned institutions has recently changed again, the object being to devote them to the more hopeful cases. The sanatorium at Westfield is now being used chiefly for women and children.

In 1907, the Prison Camp at Rutland, for the reception of tuberculous inmates of Massachusetts prisons, was founded.

The Boston Association for the Study and Prevention of Tuberculosis, founded in 1903, was another proof of growing public interest.



Composed of physicians and laymen, its example has been followed in many places throughout the state. It was instrumental in founding a "Day Camp," the "Prendergast Camp" in the suburbs of Boston, and also the second school in the country for tuberculous children, as well as other important features in anti-tuberculosis work.

During the past three years, the Massachusetts Anti-Tuberculosis League, an outgrowth of the original Boston society, was begun. The object of this latter association is to bring together the various anti-tuberculosis societies at stated periods, to compare conditions and results of work, thus encouraging coöperation of the various societies which are actively working throughout the state, and to spread by individual effort in special communities knowledge of the disease and the means of overcoming it.

The movement in Massachusetts has received a great impetus in the past three years by the establishment of a Board of Health Commissioners, which has replaced the former State Board of Health. Under the guidance of the chairman of the Board, Dr. Allan J. McLaughlin, strong influence has already been brought to bear toward enforcing laws relating to the tuberculosis question, notably those which compel any town of 10,000 or more inhabitants to establish dispensaries, and every city of 50,000 or more to build hospitals for the reception of far-advanced cases, thus doing away with the necessity of taking such patients far from their homes and friends, and at the same time removing sources of infection from the crowded and poor districts. The more recent law for the erection of county hospitals in communities of under 50,000 inhabitants, at the rate of one bed to each two deaths, is also being enforced.

At the present time, ten of the twelve cities in Massachusetts of 50,000 inhabitants or over have hospitals for advanced cases, some being under private management; four cities of under 50,000 have hospitals; and there is one county hospital in Hampshire and another already authorized for Barnstable County.

Fifty-four of the cities and towns of 10,000 inhabitants or over have now dispensaries established. Mention must be made also of the erection of separate wards or buildings for the tuberculous insane.

The Commissioners of Health are also endeavoring to bring about a more rigid enforcement of the law requiring physicians to register their cases of tuberculosis; and during the past winter the first attempt has been made, thus far unsuccessfully, to pass a law for the control of the incorrigible consumptive.

In reviewing what has been done in these matters in the last few years, when grappling with one of the most difficult problems known, one can feel only the greatest satisfaction, coupled with the belief that, with time and inexhaustible patience and persistency, tubercu-

sis can be relegated not only to the list of diseases under control, but to the list of those which are preventable. This cannot be done, however, without the active co-operation of every physician in following out closely the teachings of past years. There has been surprising and discouraging apathy and indifference up to comparatively recent times in these matters; hasty and careless diagnoses; neglect in watching symptoms which are known now to be strongly suggestive of tuberculosis, even when active signs may not be present; failure to make sputum examinations and to report cases of tuberculosis to health boards; lack of care in teaching the patients and their families the danger of infection and how it may be avoided, at the same time warning them against the wrong and harmful spirit of terrorism. All these shortcomings retard the successful outcome of the tremendous efforts now being made far and wide to lessen the ravages of this disease.

It is an encouraging thought, however, to mark, apart from what is being done in Massachusetts, the gradual change of feeling in these matters everywhere, and especially inspiring to note the enthusiasm with which this new movement at Saranac Lake has been met. The quick response to the announcements of this school should bring courage and hope to all of those who are deeply interested in it. It is you who can now act as missionaries in this great movement throughout the communities in which you live, not only in the profession but among the laity.

In the foregoing remarks, I have endeavored to give you some idea, although necessarily an imperfect one, of what has been done in my own state. With each month that passes, some new work is begun, and at the close of each year all that has been accomplished serves to make the previous record seem like ancient history. It all proves, however, the fact of the strong determination that is already increasing among our people to overcome the disease which causes the largest death rate in the civilized world.

Only by absolute patience, by dogged perseverance, with our present knowledge of the disease and its remedy, can we make progress. Let us not be deceived by the belief that the end can be gained in any given number of years. The experience of those who have been working in the State of Victoria in Australia, as told us by Dr. Victor G. Heiser, our former Health Commissioner in the Philippines, in an address last year, should give us courage to feel that possibly we can do likewise, even though our social conditions may make the task more difficult than in countries where they may be less complicated than here. The results claimed by them, as testified to by Dr. Heiser in the *Journal of the Out Door Life* of January, 1916, should be read by everyone, for they contain details of procedure which must be faced in our own country if we hope to gain the success claimed



in Victoria. Chief among these details comes the registration of every case of tuberculosis by the health authorities, which involves absolute adherence to the law which now exists with us (but is not obeyed as it should be), viz., that every physician shall report to the local board of health and to the state health commission all cases of tuberculosis. Another item, already mentioned, is the care and control of the incorrigible consumptive who, regardless of laws, of his own health and that of others, persists in spitting indiscriminately everywhere and indulges otherwise in filthy habits. Our people have not yet been brought to the pitch of insisting that such laws shall be enacted; laws which, while somewhat drastic, can be made consistent with kindness and justice to the individual, and to the community. Four states in the Union, viz., New Jersey, New York, Wisconsin, and Minnesota, have made laws for this purpose, which vary in their scope. How thoroughly these laws are being enforced, however, is a matter of doubt.

The attempt made last winter to pass such a law in our Massachusetts legislature failed, as expected, because of lack of proper knowledge of the subject among not only the legislators themselves but the people they represent. Here is another of the many details of missionary work in which we all as intelligent physicians should take part.

A knowledge of the history of medicine is of great importance to every student, that he may learn through the experience of others facts which shall make him better prepared for the practice of his profession in whatever branch he may have chosen. Having given you a very brief history of the growth of the anti-tuberculosis movement, I trust it may be helpful to you if I now give you something of my personal experience in this branch of medicine, covering a period of over twenty-five years. One learns, after years of practice in methods of treatment, that a judicious amount of scepticism to temper the earlier enthusiasm is always best, provided that one, while having a reasonable hesitation in accepting new ideas immediately, does not fall into an attitude of conservatism which may blind him to the merits of what is new and possibly useful.

I have been long enough in practice to witness the rise and fall of many a vaunted remedy for tuberculosis. Most of them have had their day only to be put, rightly, into oblivion. Some of them have had a certain amount of merit, "the grain of wheat in a bushel of chaff," and may be utilized as such. While still holding to the hope that we yet shall discover some specific remedy for this disease as in others, that may lessen its ravages, I find that thus far what we call the hygienic care of the patients is the chief factor in all treatment, such as is now made use of in all properly regulated sanatoria: fresh air pushed to its limit, the judicious use of rest and

exercise, proper diet, and close observation of the patient during the active stage of the disease.

Serums, inhalations, injections (both rectal and subcutaneous), even drugs, have been tried many times, only to fall into disuse, though a few of them have proved useful as adjuncts to other treatment. After a long-extended conservatism, however, as to the wisdom of its use, I have come, after careful observation of patients who had seemed to resist the ordinary methods of treatment, to the position held by Trudeau: that in selected cases the cautious use of tuberculin is not only beneficial and lessens the liability to relapse, but that it is often followed by complete arrest of the disease as shown by subsequent histories. That it should not be used indiscriminately, and should always be under close supervision, is my firm opinion. I cannot recall any case in which I could trace harm to the patient from its careful use, although in some it has been discontinued because of some possible discomfort or failure to note special improvement after several weeks of trial. The forms employed at Sharon are those either of the old tuberculin or the "bouillon filtré" of Dénys.

As to the use of artificial pneumothorax, our experience at Sharon would seem to show quite marked improvement, occasionally surprising, in certain cases of fairly well-advanced disease when ordinary measures had failed to produce marked results. This has not been always the case, however, and whether this method of treatment will be as frequently resorted to in the future as some of its advocates prophesy, we feel to be, in the present stage of its development, a matter of doubt.

Let me now give you something of my own personal experience in determining the presence of tubercular disease in its pulmonary form. The day of hasty diagnosis in any suspected case is past and there can be no excuse for the lack of proper and thorough examination of the patient when suspicious symptoms are present. Of paramount importance is the previous personal history of the patient, which often throws a flood of light upon conditions which may be shrouded in doubt. Given a history of malaise for several weeks or months, loss of flesh, possibly slight feverishness, accompanied or not by cough, *watch your patient* carefully and examine his chest from time to time and note if there are any departures from the normal there. Cough is, of course, a suspicious symptom, and if sputum appears it should be examined immediately, keeping the established fact in mind that repeated negative examinations do not prove the absence of tuberculosis. If, upon percussion of the chest, you find a difference of pitch in the apices, or even slight dullness, *note the fact* and watch your patient, while keeping in mind the normal difference often found in healthy individuals in the apices of the lungs.



If there is a difference in the character of the respiration in the two lungs, or a single r  le at one or the other of the apices, be still more suspicious of incipient trouble. Modern science and observation have taught us that pathological conditions other than tuberculosis can cause, possibly, apical changes, but the weight of evidence is in favor of regarding such conditions as danger signals which must not be disregarded. Personally, in accordance with my earliest teaching, I have found that such signs, coupled with systemic symptoms of fairly long duration, are, in the majority of cases, significant of early pulmonary tuberculosis, as proved by subsequent histories.

As to haemoptysis, the weight of evidence by most observers seems to show that in the great majority of cases it is a signal of incipient tubercular disease, even when physical signs are lacking; to which opinion I agree, but from long observation I regard the appearance of blood as less grave, as far as prognosis is concerned, than other symptoms more significant of active systemic disturbance. To determine the exact causes of abnormalities in the lungs, with an accompanying enfeebled condition of the patient, often taxes the power of the observer to the utmost, and even the most skilled clinician may in some cases be unable to make a definite diagnosis. To lay down absolute laws, moreover, in teaching others how we have reached our own conclusions in a difficult case, may be next to impossible.

I shrink from making excursions into the realm of mysticism, but I believe that there often comes after long experience an intuition or instinct, by whatever term we may call that sense of conviction which we cannot put into words or possibly explain to others, but which helps us to reach our conclusions,—a dangerous faculty to depend upon too much, but which I think we must confess exists to a greater or less extent in every physician of long experience in his dealings with disease.

The use of the x-ray has of late years come markedly to the fore in examinations of the chest. With all the enthusiasm that is natural to a new and fascinating study, there is no one method which should be treated, in my opinion, with more conservatism than this. It is gratifying to notice this spirit among those who are experts in roentgenology; for, while thinking it to be a valuable adjunct in the diagnosis of disease of the chest, I believe the errors arising from its use by one of slight experience are too great to warrant its being resorted to by tyros as a certain means of diagnosis. That further developments may show it to be of even greater value than now is quite possible, but on no condition should it be considered the one determining factor as to the presence or absence of pulmonary tuberculosis. More than one striking example of hasty diagnosis on the x-ray alone, involving serious mental distress to patients

who have presented no general symptom of pulmonary disease, has been brought to my attention,—a fact which makes me emphatic in my disapproval of conclusions based on this method alone.

Notwithstanding the fact that we have made a marked advance in the past few years as far as the successful treatment of tuberculosis is concerned, we have even a greater work before us in the field of preventive medicine. We are coming more and more to the belief that tuberculosis is a disease of childhood, which often lies latent, unsuspected until adult life, and then bursts into activity because of some acute exciting cause. It behooves us, therefore, to begin early to fortify children against disease by increasing their powers of resistance in every way possible. Pure milk, the adoption more and more widely of open-air schools even for well children, are among the most important factors in guarding against the development of tuberculosis. Proper housing, as a contrast to conditions often found (not alone in our poorer districts), thorough ventilation, and cleanliness in all workshops and factories, are equally essential and must be insisted upon if we wish to eradicate this disease.

As a concrete instance of the value of sanatorium instruction in the line of preventive medicine let me cite one case which bears directly upon this point. Not many weeks ago a woman who graduated from the Sharon Sanatorium thirteen years ago, and has been a most loyal friend ever since to the institution, came to my office to tell me of her subsequent history of good health and active work as a public school teacher in one of the largest manufacturing cities in Massachusetts. Sixteen years previously she had come to Sharon to remain as a patient for three years, frequently a source of despair to us because of repeated appearances of tuberculosis in varied forms. By persistent effort she finally regained her health and left with the disease completely arrested, and began again her duties as teacher and has continued them with scarcely an interruption since. Not long ago she wrote me—"I am better than ever before, and I lose no opportunity of teaching my children what I learned while at Sharon, the value of fresh air. During the past winter I have had the windows of my school room almost continually open, and I have not had one child away from school during the season on account of illness, as against epidemics of 'colds' among the children of most of the other public schools in this town."

This is but one of the many striking examples of what can be done in the way of missionary work by those who have fought the disease themselves. Such testimony as this should give us hope and courage for the future.

In conclusion I linger over the memories of him whose name this school bears, and I obey the strong impulse to tell you the thoughts which come to me whenever I recall the life and work



of the beloved leader, master and friend now gone. We are passing through a terrible crisis in the history of the world. Every day brings to us some horrible tale of blood and carnage. Thousands of gallant young lives are daily being sacrificed; tales of noble, unselfish heroism are told over and over again, and emphasis is laid upon the wonderful latent attributes of human nature that are brought out in the midst of the horrors of war. All honor to those who thus give their lives to an ideal! But let us not forget the great army of those who, with no thought of personal glory, go bravely forth each day through months and years of patient, strong endurance, facing death by disease with cheer in their hearts and a smile on their lips. There are thousands of moral heroes too who brave the harsh criticism of the world while suffering mental anguish unknown to most of their fellow men, and who cheerfully endure for the sake of their ideal. Greatly as I honor the "heroes of war," my sense of reverence for the "heroes of peace" is even greater. Of such was Edward Livingston Trudeau. Always to be associated with the memory of him, come vividly to my mind the beautiful lines of a modern poet who, had he written nothing else, would yet be entitled to high rank among makers of verse.

"A picket frozen on duty,  
A mother starved for her brood,  
Socrates drinking the hemlock,  
And Jesus on the rood;  
And millions who humble and nameless  
The straight hard pathway plod—  
Some call it Consecration  
And others call it God."

## Original Articles.

### SIIOCK AT THE FRONT.

By W. T. PORTER, M.D., BOSTON.

(From the Laboratory of Comparative Physiology at the Harvard Medical School.)

#### I.

In July, 1916, I received a letter from the Rockefeller Institute for Medical Research asking me to go to "the front" in France or Belgium, in the hope that studies upon freshly-wounded soldiers might advance our knowledge of traumatic shock and lead to its prevention or cure. Dr. Carrel had written from Compiègne that many thousands died from traumatic shock and that a remedy was urgently needed.

I reached Paris July 20, and, after the usual delays in obtaining a permit for the Army Zone, I proceeded to the wonderful hospital at Compiègne—a hospital in which suppuration, hitherto sadly inevitable and in war almost uni-

versal, has once for all been conquered. In this place, the genius of Carrel and of Dakin, and the penetrating intelligence of *Compte Du Nouy* have added a very glorious chapter to our knowledge. From Compiègne I went to La Panne in Belgium. Here, forty minutes from the trenches, Dr. De Page, a rare administrator and most able surgeon, has created an "ambulance" of 600 beds, perhaps the best of all the large hospitals near the fighting line. Through Dr. De Page, I became the friend of General P. and Colonel D., of the ——— brigade of French infantry, who invited me to visit them at Nieuport, where they were holding the sector along the river Yser. Here I remained some time, making observations in the trenches and in the postes de secours. Upon returning to La Panne, I was on duty in the receiving ward. The blood pressure was examined in all the wounded brought in during sixteen days and nights. Further observations were secured at Verdun and on the Somme.

Very early in this investigation, it was evident that my immediate duty was to study low blood pressures, from their onset until the death or recovery of the wounded. Two very practical questions were to be answered: Are the phenomena of low blood pressure in wounded men essentially those observed experimentally in laboratory animals? If so, can the lives of the wounded with low blood pressure be saved by the remedies which save the lives of animals with experimental shock? Obviously the first step was to determine whether life in the trenches, under bombardment, of itself lowers the arterial pressure or predisposes the soldier to a failure of the pressure after he is wounded. It was for this that I went to Nieuport.

Nieuport lies upon the Yser. When war broke out, the town contained about 4,000 inhabitants. Not one remains. Its handsome church, its historic tower, are totally destroyed. Nor has a single house escaped. Every day, shells fall in its streets, and crumbling walls crash down, adding fresh ruin to a scene most desolate. The town and the trenches on the opposite bank of the Yser are held by some thousands of French soldiers. Naturally, everyone lives in a cave; in the town, a cellar made proof against all but heavy shells; in the trenches, a hole dug in the earth.

By day, the streets are almost deserted. With the dark, the scene changes; the streets fill with men; horses and carts appear; and every man and every cart carries a burden; beams, baskets, ammunition, bags of chloride of lime, wicker supports for the sides of the trenches, cement, and a hundred other articles. Meanwhile, the bombardment goes on. Even when the communiqué reports "perfectly calm," there are in each regiment at least five or six wounded every twenty-four hours. It seems a small loss in a regiment of 2,500; yet this never-ceasing drain is even more important than the



spectacular "offensive." Five or six men a day is 2,000 men a year. No man can foretell when his turn may come. In fine weather, the Colonel, three officers, and myself, used to lunch and dine in one corner of a ruined court. In the course of ten days, two shells fell in that court, both at the end containing the cook-stove. At that end not a square foot escaped its piece of broken steel. But the stove was in a small recess, and the chef was near the stove. His deserts were great and he escaped uninjured. Such accidents happened everywhere in Nieuport. In the trenches, naturally, it was worse. There should have been a constant strain. It was, therefore, with the greatest interest that I undertook a study of the blood pressure under these novel conditions.

These studies began at the place most likely to yield a result, namely, in the first line trench, 38 metres from the Germans. It was a strong work, heavily reinforced with sandbags and well provided with machine guns. Through a periscope, the German line seemed strangely near. Absolutely silent, except for shell fire, it stretched across the unkempt fields as far as the eye could reach. Deserted though it seemed, to lift a head above a parapet was almost always fatal. The soldiers who held our trench were very cheerful. They bared their arms and watched the record of the blood pressure with smiles. Except that everyone spoke in a low tone and kept well against the front wall of the trench, we might have been in Paris. The arterial pressures were normal. Half an hour afterwards, an officer in that trench was shot through the head.

I made a careful study of the men under all the conditions of their apparently abnormal life, in the trenches, the batteries, the observation towers, and in their sleeping quarters. The food was good. The coffee and soup were hot even in the first line. The bread was excellent. I went to the company kitchens and fished the meat out of a kettle in which was cooking the stew for 200 men. It was all that could be desired. The latrines, which furnish an admirable index of military efficiency, were beyond criticism, even in the trenches. I went into every latrine to be found within a square mile; they were all well lined and inoffensive. The sleeping quarters, to be sure, were dark and often damp. Poor Colonel D. kept a stove going day and night near his bed and even then his cave was wet. Yet in this whole regiment, there were practically no sick. At first, I could not believe this. But as I slept with the regimental surgeon, in a black hole under a fallen brewery, the health reports were soon at my disposal. The official health return was convincing evidence. This amazing efficiency was due to the good food, the wonderful *esprit* of the officers, and the fact that the regiment was kept in Nieuport for periods of eight days, after which the men were rested an equal period at

Ost Dunkirque, where they could live above ground, though still exposed to occasional shell fire.

It is important not to judge a soldier from the standpoint of a civilian. Life at Nieuport is just as normal as life in Boston. It is different, to be sure, but well-fed men commanded by trusted officers speedily accustom themselves to the difference. Near the cellar in which I slept was a small garden, pleasantly decayed. I used to sit here under a pear tree, reading, while the Germans tried to find an annoying battery of "seventy-fives" two or three hundred yards away. Shells flew overhead sometimes at the rate of four or five a minute, but no one minded them. It was perhaps dangerous, but not very dangerous, and it was as safe there as anywhere else. The point to be made is that being under fire soon gets to be a matter of course. There is nothing in this to affect even the heart beat, much less the more stable arterial pressure.

My observations, therefore, do not support the view that soldiers under fire suffer from low arterial pressure.

The artillery fire preceding and during an attack is, of course, much more severe than the habitual bombardment. To get blood pressures during an attack, I went to Verdun, where my post was a wretched cellar at the Mort d'Homme. More than 20,000 wounded had passed through that cellar—a wet, dirty, black, verminous hole, in which one could scarcely stand upright. But at the time of my visit there was no offensive; the re-capture of Donauumont was some weeks later. After Verdun, I asked to be placed in a column of attack at the Somme. My application was backed by the highest civil authority in France, but "Grand General Headquarters" would not hear of a neutral mixing in that business. Here I got no nearer than a clear view of the aeroplanes, the sausages (stationary balloons) and the smoke of the guns. Close questioning of the officers of the Nieuport regiment, which had been in the worst of the great German drive against Verdun, made it clear that a storm of eight-inch shells is not an indifferent matter. There is some emotion. It is possible that such emotions may affect the heart beat, but there is at present no evidence and no probability that the blood pressure is materially lowered. Indeed, we are led to expect that the excitement would raise the blood pressure rather than lower it.

The air pressure from the explosion of large shells sometimes shakes the nerve cells so violently that their functions are, so to speak, shaken out of them. Paralysis, low blood pressures, and other injuries may be thus produced in men who have no visible wound. The treatment of these low blood pressures does not differ from the treatment of those following wounds, but the prognosis is probably less favorable.



Experiments made with Dr. Story (Porter, W. T., and Story, T. A., *American Journal of Physiology*, 1907, xviii, p. 184) in 1906 showed that when an animal received a blow on the skull, the general blood pressure fell to 33 mm., but soon rose again to the normal. Thirty millimetres is the level to which the pressure sinks on removal of the spinal cord. Similar effects are seen in soldiers from the air pressure of exploding shells. In Amiens, I examined cases in which the low blood pressure had continued several days but with ultimate recovery.

Serious injury is also produced by the inhalation of the hot gases liberated by the explosion,\* but I have no data as to the effect of such gases on the blood pressure.

The usual history of a wounded man with low-blood pressure may be learned from one of the cases which fell under my own observation. A shell explodes in a first-line trench. The fragments tear the thigh, breaking the femur; the arm is also wounded, and some small pieces of steel enter the back here and there. The brancardiers (stretcher-bearers) quickly arrive, the man is placed on the stretcher, and borne to the poste de secours. As the first line is a mile from the poste and the trenches are narrow, progress is difficult, especially when the stretcher meets great cans of hot food slung from a pole resting on the shoulders of two men. At the poste, the wounded man is carried down some steps into a cellar, his wound is covered with a bandage, and he receives an injection against tetanus. Meanwhile the ambulance has appeared. The stretcher is placed on the rack in the ambulance, and I am placed at full length on another stretcher alongside the wounded man. The ride to the nearest temporary hospital begins. The road is rough, especially where it has been pitted with shell fragments. I find the jolting painful, but the wounded man is too far gone to groan. Our feet are next the curtain which attempts to close the rear end of the ambulance. A cold draught chills them. I reflect that as the patient is on the verge, this additional exposure may finish him. After almost an hour, the ambulance runs over cobblestones, even rougher than the country road, and we reach the *Pavillon de Réception*. A cry of "blessé" is heard. Brancardiers run out, the wounded man is carried into a large ward and laid on the floor. Orderlies appear with one large bag for his clothes and one small bag for articles from his pockets. He is placed on a bed, largely stripped, and washed. After a few minutes the surgeon appears. He finds the man with eyes turned up until only the whites are visible, the skin cold, the face muddy parchment, the heart frequent and feeble, almost no pulse at the wrist. Hot bottles are put in the bed. An intravenous injection is ordered. An ice-cold flask containing 1000 cc. normal saline

solution is put in a pan of hot water. When the nurse thinks the saline should be warm, the whole quantity is pumped with a two-bulb syringe into a vein at the elbow. An hour is allowed to pass, so that the patient may be warmed and the saline solution may take effect. He is then lifted onto a stretcher, carried to a chilly operating room, placed almost naked on a cold table, chloroformed, his wounds widely opened—to prevent gas gangrene—and the bleeding vessels tied. Returned to his bed, a friendly nurse puts several pillows under his head and shoulders, and his body sinks comfortably down on the springs, so that his feet and legs are also higher than the abdomen. He is surrounded with hot bottles and often receives a stimulating hypodermic. After this, he takes his chances.

This is a typical case and it explains perfectly why so many men die from low blood pressure.

## II.

My observations upon low blood pressures are set forth in a brief statement drawn up at the request of Professor Richet and presented by him to the French Academy of Sciences, October 30, 1916. This statement is as follows:

The number of wounded who suffer from low arterial pressure is very large, much larger than most surgeons believe. The greater part of these wounded can be saved.

I have studied low arterial pressures in my laboratory and at the front.

My observations upon animals show that: (1.) When the diastolic pressure remains some time at from 45 to 50 mm., it will not recover without aid. Unless the proper remedies are employed, the animal dies of shock. A diastolic pressure of 50 mm. is therefore "critical." (2.) When the diastolic pressure falls to 50 mm., the blood accumulates in the abdomen. This is a fact of the first importance. The animal bleeds to death in his own portal veins.

My observations upon wounded men at the front demonstrate: (1) That there is no essential difference between the low blood pressure of man and that of other animals. (2) The remedies that are successful against low blood pressure in animals are also successful against low blood pressure in human beings.

These remedies are: (1) gravitation; (2) the raising of the blood pressure by the injection of normal saline solution; (3) the raising of the blood pressure by adrenalin.

On coming from the ambulance, the wounded with low blood pressure should be placed immediately upon a special operation table (Fig. 1) heated by electricity. When an operation becomes necessary, the table is rolled into the operating room. The feet of the patient must be kept 30 cm. higher than the head, so that the abdomen may be higher than the heart and

\* Personal communication from Professor Richet.



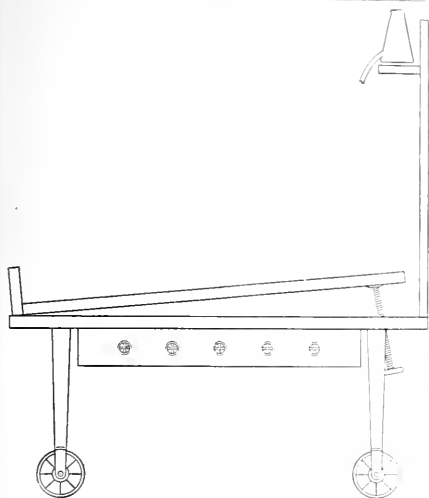


Fig. 1.

brain. The patient must stay upon the table until the diastolic pressure will remain almost or quite at the normal level.

The treatment by the inclined position requires time—an hour or more. If the patient's state is grave, he might die before gravitation produces its effect. In such a case, it is necessary to raise the diastolic pressure immediately from 20 to 30 mm. above the critical point.

If, therefore, the diastolic pressure is less than 80 mm., normal saline solution should be injected into a vein. The injection should be slowly made, and it should stop when the diastolic pressure reaches 80 mm. If the pressure falls again, adrenalin should be injected into a vein, preferably near the malleolus. The object of these injections is to keep the pressure above the danger point until gravitation is able to maintain the pressure at a safe level.

Occasionally there are cases too low for immediate operation and in whom death is threatened from slight but persistent hemorrhage. Normal saline injections or adrenalin would increase the hemorrhage by increasing the blood pressure. Such cases demand the transfusion of blood. Some of the blood transfused will be lost by the hemorrhage, but enough may be retained to bring the patient to the point at which the vessels may be tied and the usual treatment for shock instituted. Since donors object to arterial transfusion, because of the operation and the fear, arrangements should be made for withdrawing the donor's blood from a vein into paraffined tubes.

Finally, there are perforating wounds of the chest, in which the inclined position threatens asphyxia, while if the patient sits up, he may die of shock. For such cases, there is no present remedy.

The application of the general principles just stated to the routine work of a military hospital demands more detailed instructions. At the close of the work at La Panne, my report to Dr. De Page on the systematic treatment of low blood pressures was issued by him to the staff (Note No. xxviii, *Sur le traitement du shock chirurgical*, Sept. 11, 1916), and it may serve here as an example of the necessary instructions. I quote only those parts of Note xxviii which may complete the data given above.

From a practical standpoint, shock exists when the diastolic pressure is 60 mm. or less. The blood then accumulates in the portal veins, the activity of the heart is impaired, and the nutrition of the nerve cells is affected. The treatment of shock requires:

1. A special position of the wounded; the abdominal vessels should be higher than the heart and the brain.
2. Heat.
3. Intravenous injections of normal saline solution.
4. Intravenous injections of adrenalin.
5. The transfusion of blood, in certain cases.
6. The taking of the diastolic pressure every half hour.

1. *Position:* The patient should be placed at once on the special bed,\* to be found in the Receiving Ward. This bed is of the following description: (a) the central part is of a size identical with a surgical operating table. (b) The removable side pieces increase the width to that of the ordinary hospital bed. The patient must not be taken from this bed as long as the arterial pressure is too low. (c) The foot of the bed must be raised 30 cm. The pillow must not be more than 6 cm. high. (d) The bed is heated electrically from below. (e) When the side pieces are lifted off, the bed is transformed into an operating table. (f) A stand 1.5 metres above the patient supports a bottle of normal saline solution, kept at 39° C. by an electric heater.

2. *Heat:* The heat should be continued until the feet and hands of the patient are warm. The heat should then be turned off at least for a time.

3. *Injections.* (a) When the diastolic pressure is below 80 mm., normal saline solution† should be injected into a vein. The fluid must be at 38° C. when it enters the vein. About 500 cc. may be injected, but it is not desirable to continue the injection after the diastolic pressure has reached 80 mm. The injection should be slowly made, lasting about 10 minutes. If the pressure falls some time after the first injection is given, a second injection‡ of normal saline should be made. The quantity should

\* This bed was described at La Panne (Sept. 11, 1916).

† At La Panne, 0.9 per cent. was used. It is called NaCl 0.9, but 0.85 NaCl 0.9 is given in the report.

‡ It is recommended by Professor N. O. R. that the second injection contain 1 gram adrenalin. I prefer to use 1 cc. of 100 mg. adrenalin solution.



again be 500 cc. provided a diastolic pressure of 80 mm. is not reached with less, and the injection should occupy about 10 minutes. (c) If the pressure falls below 80 mm. after the second injection, adrenalin should be injected into another vein. The adrenalin, in a solution of 1:1000, should be kept in a stoppered flask in the dark. Solutions not colorless should be rejected. At the moment of injection, mix 0.5 cc. of the adrenalin solution in 50 cc. of normal saline solution, at 38°. The injection should be made very slowly, and should be suspended if the heart becomes irregular.

4. *The transfusion of blood.* The indications for transfusion have been mentioned above.

5. *Measurements of the blood pressure.* The diastolic arterial pressure must be recorded at least every half hour. It is especially upon the diastolic pressure that the nutrition of the nerve cells depends. Since the heart-beat in low blood pressures becomes frequent and feeble, the systolic pressure is relatively more affected than the diastolic, and is therefore a less reliable guide.

I can myself bear witness that at La Panne the practical results of these procedures were most gratifying. Dr. Carrel tells me that the method has been found very valuable at Compiegne.

In every serious wound, it is most important that the diastolic pressure should be recorded at the earliest moment. With the auscultatory method, I have often made this measurement in two minutes. The longer a low arterial pressure continues, the more difficult the recovery. Yet very desperate cases may be saved. At La Panne, men who looked like a cadaver, and were almost pulseless, came back to life, and after two hours talked pleasantly of their children.

## FAILING CARDIAC COMPENSATION DURING PREGNANCY.

By CHARLES H. LAWRENCE, M.D., BOSTON.

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It is not the purpose of this paper to discuss the general subject of heart disease and pregnancy, nor to raise the question of the advisability of patients with cardiac disease becoming pregnant. So much has already been written upon these topics that there is now a definite basis for agreement, or disagreement, among obstetricians and internists concerning the influence of one condition upon the other.

Most of the data, however, have been collected in large lying-in clinics, and apply more correctly to the class of patients attending such clinics than to those met in private practice.

Moreover, the evidence is largely concerned with the mortality statistics of women with heart disease who become pregnant, and presents but meagre description of the factors which were potent in causing the results thus tabulated.

Face to face with the question of advising an individual not to have children on account of her cardiac condition, or that pregnancy be terminated before the period of viability for the same reason, statistics furnish a sound basis for general statements, but are disappointing as an aid to definite decision in any given case. Each problem is an individual one, and save in the very slight or very marked cases of cardiac disease, statistics are of value only in so far as the physician is able to place the patient in the proper classification afforded by tabulated evidence, and then correctly to judge the given heart as able or unable to meet the demands of pregnancy and labor. The risk lies in our ability so to judge. For though, as Stengel and Stanton have shown, pregnancy does not cause cardiac hypertrophy, and only a moderate dilatation of the right ventricle during the latter months, it *may* be the indirect cause of a greatly increased demand upon the heart through its common effects such as distention and insomnia, through its complications such as pyelitis or toxæmia, or through its termination by prolonged or difficult delivery. Therefore in estimating the ability of any heart to meet the possible demands of pregnancy, the margin of safety demanded must be a wide one and the estimation of cardiac compensation and reserve must be based upon thorough and painstaking examination of the circulatory apparatus, and upon the understanding that the patient must be very closely watched during pregnancy and labor for signs of failing compensation.

The classical signs of failing heart, dyspnoea, edema, and tachycardia, often appear too late to be of use in avoiding catastrophe, or give no warning of the acute dilatation which cuts short what is apparently normal life for the patient. Therefore, if patients with cardiac lesions are to be carried through pregnancy successfully, we must learn to recognize, and make use of, the minor signs of failing compensation.

What are these signs, and are they of any value in detecting diminishing efficiency of the circulation? Various attempts have been made to establish a simple functional test for the heart, but none has been completely successful. The evidence obtained by combining several is, however, valuable. All have the common characteristics of throwing some light upon the condition of the myocardium.

First among the methods of estimating the ability of the heart to meet the demands imposed upon it belongs the examination of the past history. It furnishes first, data concerning the amount of strain the heart has been, and therefore probably will be, called upon to meet by reason of the patient's habits and disposition.



In it may lie the explanation of failing compensation in a heart apparently only slightly damaged. And second, the history furnishes reliable information as to the heart's ability to respond, not to test exercises of measured amount, but to the total demand made upon it by life as the patient lives it.

In the absence of a history of a definite break in compensation, what points in the story suggest that the heart's efficiency has been seriously impaired? Careful questioning will often bring out the fact that the patient has had intermittent and transitory periods of feeling below par—especially characterized by disinclination to exercise. Not infrequently such periods are accompanied by slight, continued unproductive cough, and by rather poor sleep, for which no definite cause can be found. And occasionally there may be a story of an intermittent discomfort under the shoulder blade, or especially if the lesion be mitral stenosis, of slight pain in the praeordial area.

Such attacks are usually ascribed by the patient to any cause save the heart. But anyone who has the constant care of cardiac patients learns that the debility, insomnia and discomfort in chest or shoulder disappear under the influence of digitalis and rest, and are, in effect, signs of slight cardiac failure, and that a patient with such a history should not be subject to suddenly increased work, such as labor demands.

Whatever the physical examination reveals, such a patient, if she is to continue her pregnancy, should be placed under close observation, preferably in a hospital, in order that further tests of cardiac efficiency may be accurately carried out. The pulse rate under conditions of absolute rest and the change from it to moderate exercise should be carefully observed for several days. Taszkai states in a recent article that while normally the pulse rate increases with the change from lying to standing, this reaction is abolished early in pregnancy, and its reappearance means myocardial insufficiency. If further work supports this observation it will be a most valuable aid, but at present it can be said that a marked variation in pulse rate under conditions of rest and activity is a sign of diminished cardiac reserve.

Similar in principle is the observation of Schoonmaker of Philadelphia. He observed the variations in systolic and diastolic blood pressure in relation to posture and very moderate exercise. He concludes that with good myocardial efficiency the change from the lying to the standing position is accompanied by an increase in systolic pressure and a stationary or increased pulse pressure. Moderate exercise produces the same effect. A decrease in systolic pressure, together with a decrease in pulse pressure, has, in his experience, been associated with poor to bad myocardial efficiency. The writer has applied this test to a small series of cases,

and so far agrees with Schoonmaker as to its reliability in the non-pregnant. Whether it holds good during pregnancy, or, like the pulse variation, is abolished by that condition, remains to be proved. The point is worth investigating.

During the period of observation the patient's respiration should also be closely watched. The majority of lesions encountered during the child-bearing period involve the mitral valve, and cause increased strain, particularly on the right side of the heart. Beginning cardiac failure, therefore, means less efficient pulmonary circulation, with decreased oxygenation of the blood and tissues. This condition stimulates the respiratory center, and brings about an increase in the respiration rate. And observation of cardiac patients with slightly impaired compensation shows that the respiration rate averages higher than normal, and is more easily accelerated.

Another observation to be carried out is that of urinary output. This is of value, however, only when combined with a careful account of fluid intake, and without it may be exceedingly misleading.

In all cases of mitral stenosis, no matter how perfect the apparent compensation, the apex rate should be recorded with the radial, since a discrepancy between the two, or pulse deficit, gives valuable information concerning cardiac efficiency. The deficit appears earlier in stenosis of the mitral valve than in other conditions, and may be overlooked unless searched for as a routine. While it is true that some patients with mitral stenosis carry a constant pulse deficit, that fact is no argument against the condition meaning incomplete compensation. And analysis of cases shows that it is just those patients that are most apt to die suddenly and without other warning symptoms.

Recently, interest in the venous blood pressure has greatly increased with the production of clinical methods of recording it. From a prognostic point of view the work of Clark is most interesting. In the cases observed by him, a venous pressure over 20 centimeters of water is of bad prognostic import, as is a steady rise. He has further observed that urinary output bears an inverse relation to venous pressure. His observations need confirmation on larger series of cases, but if correct, will add one more sign to the list spelling early cardiac failure.

It is the writer's belief that a patient with cardiac disease who has exhibited the signs enumerated above to a degree sufficient to warrant a careful routine examination, should, while under observation, be given one further test—the therapeutic test of the effect of digitalis. The patient is anticipating an event which must throw suddenly greatly increased demand upon the heart. During the latter months of pregnancy there is a constant though moderate dilatation of the right side of the



heart. In the majority of cases it is the right side that suffers most from the lesion encountered. It is therefore fair to assume that at some stage of the game digitalis will be indicated, and if it can be ascertained beforehand, without harm to the patient, what the effect of digitalis will be, how much that particular heart requires, and how the required dose will be borne, the physician is in possession of valuable information. It is of course not necessary to give digitalis to every pregnant cardiac patient, but the writer believes it is a measure of safety to test the effect of small doses on any who have had signs of decompensation, even though the signs were not in themselves marked enough to demand its use in a non-pregnant patient. Under careful observation, the test is in no way dangerous.

Given a patient who has had slight failure of compensation which disappears under proper treatment, what shall be done during the remainder of pregnancy? First, the decision must be made at this point as to whether the patient may be allowed to continue pregnant, or whether the uterus must be emptied. And if the latter course be decided upon, it should be carried out at once. The physician should be in possession of enough evidence at this time to make his decision sufficiently certain to act upon, for if he hesitates further, he is likely to encounter conditions which make waiting and interference alike extremely hazardous.

If the patient has had a previous break in compensation or numerous small periods of sub-efficiency of the circulation, or if with mitral stenosis the latter only have occurred frequently, it is the writer's belief that pregnancy should be allowed to continue for one reason only—that the patient, in full knowledge of the risk she runs, refuses to forego the chance of bearing a child. Under such conditions, sudden death or chronic invalidism are too often the result of allowing pregnancy to continue to justify the physician in advising it.

If the patient elects to run the risk, what can be done in the way of treatment? Education in sparing herself all the strain she possibly can will do much. Some writers believe that too much emphasis should not be laid on the patient's condition, arguing that in such cases optimism is a great asset. With the latter idea the writer thoroughly agrees, but optimism should be based upon the patient's ability and willingness to give herself every chance and not upon the hope that she may pull through somehow. "It is a condition that confronts us, not a theory."

Should such a patient be given digitalis more or less continually? The writer's experience with ambulatory heart cases convinces him she should. Although digitalis is said to be indicated only in broken cardiac compensation, there are in every out-patient medical clinic numerous patients whose compensation remains

sufficient only so long as they take digitalis, and fails when they cease to do so. Its continued use does not provoke tolerance. There are on record at the Massachusetts General Hospital patients who have taken it practically continually for five years without harm or decreased effect. If in the latter months of pregnancy the right side of the heart is continuously dilated, and if the patient has superimposed on that condition a mitral lesion, digitalis logically should be of benefit. It is not necessary to give it daily, for, owing to its prolonged action, the patient may be kept under its influence by taking it, for example, five days a week during three weeks a month. Such a régime will often make the patient much more comfortable and will diminish rather than increase the work the heart does. Furthermore, it tends to prevent the accumulation of fluid in the abdomen and pelvic organs. The absence of demonstrable edema on the surface is not proof that it does not exist in the internal organs, to complicate operation and increase danger of infection if pregnancy be terminated, as it often is in such cases, by Caesarian section.

The other alternative is that which would be chosen for the non-pregnant patient—rest in bed so long as compensation cannot be maintained without the aid of drugs. Pregnancy, and impending labor, however, introduce the certainty that this rest cannot be continued indefinitely, and may be suddenly terminated by the extraordinary demand of labor upon the heart. In preparing for this demand, it seems more logical and actually gives better results, if the patient's general muscular tone, and particularly that of her cardiac muscle, be given the benefit of a moderate exercise, even though this régime requires the administration of some digitalis. Eliminating all exercise tends to produce muscular weakness and constipation, and is not the logical way to prepare the heart for the extreme effort of labor. That this is true practically as well as theoretically is shown by the results in such cases. Too often the heart, compensated for rest, is entirely unable to meet the demands of labor, even though that event be made as short and easy as possible. The writer believes, therefore, that it is wiser to treat the patient as an ambulatory case, guarding against decompensation by giving digitalis as described above, so long as the drug does not upset the stomach.

This latter condition cannot be too carefully guarded against. Abdominal or even gastric distention has more than once been sufficient to change the condition of the heart from good to fair, or from fair to poor compensation. The elimination of carbohydrates, and the division of the necessary amount of food into six small meals, often adds greatly to the comfort of a patient with slight cardiac inefficiency.

If digitalis is given, as suggested, any emergency arising during the period of its omission



can be met by intravenous medication—a method which should be used more often in cardiac emergencies.

In mitral lesions these emergencies are usually due to acute dilatation, mainly of the right side of the heart. Such a condition demands vigorous treatment, directed along two lines—first, the reduction of the load the right side is carrying, and second, stimulation of the heart muscle. To meet the first indication, venesection is by far the most satisfactory manoeuvre at our command. The writer has used it in twenty cases, has repeated it several times in several patients, and on the basis of this experience believes that it acts more promptly, more surely and more thoroughly than any medication. The amount of blood removed can be accurately controlled, and the bleeding stopped instantly if necessary. In emergency it can be performed in less time than it takes to give a hypodermic injection.

In obstetrics the objection may be raised against it that the patient, if labor ensues promptly, will lose still more blood, and that it is therefore unwise to deprive her of any beforehand. Venesection, however, may make all the difference between life and death. The amount of blood it is necessary to withdraw materially to benefit the heart is usually not over ten or twelve ounces. And with transfusion reduced to its present simple technic an equal amount of blood may be quickly introduced into the circulation. Venesection should not be withheld in the presence of acute cardiac dilatation from the fear of subsequent loss of blood.

For the stimulation of the myocardium *digitalatum* intravenously, or if the patient is free from digitalis, *strophanthin* intravenously have given the best results in the writer's hands. The latter has caused no bad effects when given to patients not under the influence of digitalis.

In spite of the greatest care in deciding which patients can go through pregnancy handicapped by cardiac disease, and in regulating their lives with regard to that handicap, there will be unavoidable catastrophes. Pregnancy and imperfect cardiac compensation are incompatible, and their coexistence constitutes always a grave menace to the patient. One or the other must be eliminated; either good compensation must be maintainable under ambulatory conditions, or pregnancy must be terminated. And if the patient's life is to be saved, the decision must be reached before the latter method of meeting the situation becomes too hazardous.

MISSISSIPPI VALLEY MEDICAL JOURNAL.—It is announced that the name of the *Louisville Monthly Journal of Medicine and Surgery* has been changed to the *Mississippi Valley Medical Journal*, which will be published as the official organ of the Mississippi Valley Medical Association, and will contain all its proceedings.

## SOME OF THE CLINICAL EVIDENCE RELATING TO THE ETIOLOGY OF EPILEPSY, INCLUDING SOME NOTES ON THE CONDITION OF THE TEETH AS A FACTOR IN ITS PRODUCTION, AND ON ITS RELATION TO ALCOHOLISM AND TO MENTAL DEFECT.

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STUDENTS of epilepsy will for some time be divided into a group who adhere to the tradition that it is primarily or entirely a disease of the brain, and a group who look upon it as an intoxication, probably of intestinal origin. The writer, although having for four years held the latter theory, has not yet been convinced that epilepsy is in every case the result of infection by a specific organism, because he has so often seen the arrest of the disease follow the correction of errors in diet and the relief of indigestion and constipation without any treatment designed to remove a supposed infection. On the other hand, he has never seen the arrest of the disease occur when those simple measures have been neglected, even after the removal of the colon, not to mention the persistent use of intestinal antiseptics.

In an article on the treatment of epilepsy by diet, published in 1914, the writer said that the outcome of a case might depend upon the repairing of the teeth. This statement might well have been more elaborated at the time, and in order to show on what basis of fact it rests, I have made notes on the condition of the teeth in fifty consecutive cases. In these cases the teeth have been classified as "good," "fairly good," "bad," and "very bad." In so classifying them, certain cases have been used as standards but it is admitted that those who know much about the teeth might draw the lines elsewhere. For example, a case in which two molars are absent and the other teeth are intact is classified as having fairly good teeth, by which is meant about the average; while one in whom one bicuspid is absent and two molars and two bicuspids are almost gone is classified as having bad teeth. One in whom four molars are absent marks the line beyond which cases are classified as having very bad teeth. Only the fitness of the teeth to perform the function of chewing has been considered, and the presence of unerupted teeth has not been sought for, because the object of the work has been merely to show that the failure of the teeth to perform their function is a factor in the production of epilepsy. In age the patients range from three and a half to sixty years. They have not been selected, and include almost all the conditions that have been supposed to produce epilepsy, with the probable exception of intracranial tu-



mor. In fully half of the cases the diagnosis of epilepsy was made before they were seen by the writer, and in none of the cases has the diagnosis been disputed by others.

Of the fifty cases, five have good teeth, five have fairly good teeth, thirteen have bad teeth, and twenty-seven have very bad teeth. Twelve of the patients when seen were subject to tooth-ache, some of them always finding it painful to chew. All of the fifty were constipated. Twenty-five readily admitted that they were bolters and eleven that they habitually ate too much. Three had severe gingivitis. At least one had chronic appendicitis, the diagnosis being confirmed by x-ray. One had syphilis. Six were feeble-minded and one insane. One of the feeble-minded has a cerebellar hypoplasia and one has spastic paralysis. The patient with spastic paralysis is the only one of the fifty in whom there is physical evidence that the brain has ever suffered trauma. This patient is an idiot, nine years of age. She is said to have been well and normal until one and a half years of age, the age when children begin to eat solid food. She then had diarrhea and a convulsion. After the first convulsion she had many others and many falls, and for a time she was in status epilepticus, during which time she is said to have been blind, and since which time there has been spastic paralysis of one arm and both legs. Briefly, when the child began to take solid food, she had diarrhea and then a series of convulsions, during which there was a cerebral hemorrhage. The digestive troubles and the convulsions have continued. She eats a great deal when permitted, and cannot chew because the upper molar teeth are carious and the upper front teeth are absent. She is very constipated. She has improved greatly since having her diet adjusted to the condition of her teeth. In this case, where there is imbecility and a cerebral palsy, digestive troubles preceded the epilepsy, and the epilepsy has become less severe under treatment of the digestive troubles. This has been true of all cases seen by the writer. This case is not an exception, but is typical of at least the majority of cases in which the diagnosis of "organic" as distinguished from "idiopathic" epilepsy has been made. The diagnosis of "organic" epilepsy is too often made merely because there is a history of a fall or an injury to the head. Overfeeding, in a mistaken effort to restore the patient's strength, is often the actual cause of an epilepsy following an injury or an illness. The following are three of a number of cases that I have seen which demonstrate this:

A little girl, six and a half years of age, was struck by an automobile. She was unconscious about half an hour and vomited three times. Five teeth were knocked out and there was much swelling about the face and head. About two years afterwards she had a grand mal attack and six months later another. Now, at the age of nine, she

is having one every two or three months. Neurological examination is entirely negative. The following facts, obtained on further questioning the mother, show how grave an error would have been made in calling this a case of "organic" epilepsy, even granting that there may have been a slight concussion of the brain. The child had to be fed through a tube for a time after the accident. She lost weight and the mother had tried to build her up. She thought home-made bread was a good thing for this purpose, and made it especially for the child, who was very fond of it, and also of beans (these being two of the articles of diet which are most certain to induce attacks in epileptics). The child is "a very hearty eater, but does not seem to gain flesh." The mother has tried to persuade the child to chew her food, but without success. The child is very restless, cannot sit still, and tosses and grinds her teeth at night. Sometimes the bowels do not move for two days.

Last winter a girl ten years of age, and otherwise well, was discovered by the school physician to have a heart murmur, and was advised to rest and have "plenty of nourishing food." Forced feeding was begun, and she ate four eggs daily for about six months. She became fat and constipated and then began to have petit mal attacks.

Three years ago a boy of seventeen had pneumonia. He had always been a bolter and a gourmand, and during his convalescence he was encouraged to eat still more, especially of milk and eggs. For three years he had several eggs and a quart of milk daily. Grand mal attacks began soon after the illness and have continued. Neurological examination is negative.

Not to study these cases from the broad, although commonplace, standpoint of the general practitioner is to be guilty of negligence. It is this failure to descend to the plane of commonsense that has made the treatment of epilepsy so unsuccessful. The statement so often made, that constipation and indigestion are the results of epilepsy, is not true. In more than three hundred consecutive cases the writer has invariably obtained a history of digestive troubles preceding the epilepsy.

Of the ten cases classified as having good or fairly good teeth, all are constipated. All have gross errors of diet. Seven admit that they are bolters and three that they are gourmands. Two have very bad home conditions and four are feeble-minded. The two with bad home conditions are a boy of fifteen who, because his father is a drunkard, is always compelled to go out and earn money to buy food before he can eat, and another boy of five who is neglected for the same reason. Epilepsy in the children of alcoholics is more rationally and more scientifically accounted for in this way than by heredity. It is desirable to emphasize this point because a great deal of labor has been expended in compiling statistics to show that epilepsy in the children is the direct result of alcoholism in the parents. It is not. It is the direct result of neglect and not of heredity. There is experimental proof of this in the fact that epilepsy in



the children of alcoholic parents is just as amenable to treatment as epilepsy in other children, provided that they can receive proper food and care.

The relation of epilepsy to mental defect is another subject in regard to which the writer believes the authorities to be in error. Its frequency in the feeble-minded has been regarded as evidence that it is a disease of the brain, but, as the writer has shown in a previous article on Diet in Epilepsy, the theory that it is an intoxication of intestinal origin is in absolute harmony with observations on the feeble-minded, and in fact it is here that some of the most convincing evidence may be found. All of the imbecile epileptics seen by the writer have swallowed their food without chewing, and have eaten more than they could digest, and some of them have had the habit of swallowing paper, wood, stones, buttons and other objects. This is the reason why the prognosis is bad in such cases. Mental defect developing after the beginning of epilepsy is another thing, and it may be accounted for in one or in all of three ways: by vascular lesions in the brain occurring during the attacks; by the destructive effect of irritating toxins upon the finer tissues and structures of the central nervous system, and by the similar effect of bromides. The first thing is known to occur, while the second and third are only reasonable hypotheses. In the children of mentally defective mothers, epilepsy occurs for the same reason that it occurs in the children of alcoholics, that is, because such children are not properly fed. Since January 1, 1914, thirty-four feeble-minded epileptic children have been examined, and there was not one without severe digestive troubles and the history of bolting and gourmandizing was given by nearly all the mothers. Some of the mothers said they allowed the children to eat almost constantly because it was the only way to keep them quiet. One of the evidences of mental defect which may be seen very early in life, and which I believe to be of some diagnostic value, is the absence of the sense of having eaten enough. It is akin to the blunting of other senses, sometimes seen in imbeciles.

Errors in diet seem to have been present in all of several hundred cases studied by the writer. By an improper diet I mean one containing an excess of fried food, fried meat, fresh white bread, and other indigestible things. Epileptic children are frequently made worse by drinking large quantities of milk. Any solid food that the patient will not or cannot chew should be forbidden. Notwithstanding statements in the text books, meat is not harmful to these patients if they will chew it. I have seen many a patient who has steadily grown worse on a vegetarian diet, improve on being allowed to eat meat, on condition that he chew it. The condition of the teeth is an important guide to be followed in prescribing the diet in epilepsy, which must be mechanically as well as chemi-

cally suitable for the patient. The theory that there is a deficiency of calcium in the tissues of epileptics seems to me to be inconsistent with the fact that my own cases have always done as well, if not better, with sodium bicarbonate treatment as with calcium lactate. The temporary relief that sometimes follows the exclusion of salt from the diet may be explained by the fact that the patient has eaten less because his food has been rendered unpalatable.<sup>2</sup> Recent investigators of heredity as a factor have found that it is of less importance than it was formerly considered to be, but whatever the frequency of heredity, it must not be forgotten that wrong habits of eating are handed down from one generation to another.<sup>3</sup>

As has been stated, twenty-seven of the fifty cases have very bad teeth. Of these cases fifteen have lost four, five, or six molar teeth; five have lost all molars; in five all upper or all lower teeth are absent or carious; in two all teeth are absent or carious; in one patient all teeth are artificial; and in one, half of the teeth are artificial. It is true that neglected teeth are seen more often in hospital than in private practice, and time has not permitted me to make notes on the condition of the teeth in fifty non-epileptic hospital patients for comparison with the fifty epileptics, but I have for comparison some data from my own records of the medical inspection of school children. In one of the Brookline schools I found, among two hundred and forty-eight children, only sixteen, or 6%, with bad teeth, according to the classification used in this work, while in this group of epileptics, 80% have bad teeth. We may conclude that epilepsy is not common in those who have good teeth.

Among my cases there are some in whom epilepsy began very soon after the loss of a number of teeth. Here are two such cases:

P. M., male, age 9.

*Family History.* Mother has had five pregnancies and has miscarried twice.

*Past History.* Birth difficult. Mother in labor three days. Instrumental delivery. Asphyxia. Weighed nine pounds. Breast fed. Did not hold head up for one year. Crept at two years. Walked with support at three years. Spoke at four years. Entered school at seven and is in Grade 3. Always promoted. Lost lower molar teeth between age of four and five. When permanent teeth appeared they soon decayed. Used to drool.

*Present Illness.* At the age of five he began to have attacks in which he was unconscious for a few minutes, and would clench his fists and set his jaws. Knows when attacks are coming, and calls for mother to bring water. No other history. Does not bite tongue, froth at mouth, or pass urine or feces. Frequency, about once a month, sometimes with an interval of several months. Has a good appetite. Eats more rapidly than other children. His mother says, "He wants to put in a great big bite and swallow it down."

*Physical Examination.* Heart negative. Some tenderness over cecum. All lower molar teeth ab-



sent. Eyes negative. All cranial nerves normal. No tremor. All tendon reflexes lively and equal. Cutaneous reflexes normal. No ataxia. Gait awkward with feet apart. Movements of hands awkward. Lower lip hangs down and mouth is open, while nares are not obstructed. Expression not alert. Eyes vacant. Does not pass mental tests suitable to age and environment.

In this case there was probably trauma at birth, causing mental defect, but the epilepsy did not begin until the age of five, and it followed the loss of the molar teeth.

A young woman of twenty was operated on for appendicitis three years ago, and after the operation she suffered from constipation. All her upper molar teeth and upper incisors were artificial and supported by bridge work. A year ago, because of severe trifacial neuralgia the artificial teeth were removed, so that she could no longer chew her food. The neuralgia was not relieved, and soon after losing the teeth she had an epileptic attack, and she has had three other attacks since then.

The work of having the teeth of these patients repaired proceeds very slowly, but at some future time I hope to report the results, if any, thus obtained. At this time it can only be said that those patients who have had the work done are doing well.

When there is difficulty in making a diagnosis between epilepsy and hysteria, or between epilepsy and intracranial tumor, a bad condition of the teeth, in which the chewing surface is inadequate, is evidence in favor of epilepsy.

Epilepsy is rare in breast-fed infants, and it does not often occur before the age of eighteen months. In another series of fifty epileptic children under twelve years of age, the writer found that in only seven it began before the age of one year, while in twenty it began between the ages of one and two, and in only twenty-three did it begin during the long period from two until twelve. Therefore, epilepsy in childhood usually begins at the time when the child is beginning to eat solid food that requires chewing, and when the teeth are often not sufficiently developed to do the work. In four of this series of epileptic children there was spastic paralysis, demonstrating injury to the brain, but the four were all feeble-minded, and gave the usual history of gourmandizing and bolting of food, which the writer believes accounts for epilepsy in the feeble-minded.

Epilepsy resembles tuberculosis in having no specific cure, and it should be treated, like tuberculosis, by common-sense methods, with close attention to detail. It has to be regarded at once from the viewpoint of the neurologist and from that of the general practitioner. Three years ago the writer suggested intestinal surgery in some cases of epilepsy, but he has seldom been compelled to advise surgery, because good results can be obtained without it, and in the majority of cases the dentist, rather than the surgeon, should be consulted.<sup>4</sup> The prognosis in

many cases of epilepsy depends largely upon the possibility of repairing the teeth.

The series of fifty cases is, of course, too small to prove that eighty per cent. of all epileptics have bad teeth, but if in a larger series the percentage were to differ by twenty-five with the percentage in my series, it would still show the majority of epileptics to have bad teeth. Most of my patients have been children, and in a series of adults the percentage having bad teeth would probably be higher.

The series of over 300 cases, in every one of which digestive disturbances preceded the epilepsy is, I believe, large enough to answer conclusively the question of whether the visceral changes found in epileptics at autopsy are primary or secondary.<sup>5</sup>

I am indebted to Drs. J. J. Thomas and A. W. Fairbanks for the use of the material in the Children's Hospital, where about one-third of the cases were seen.

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### Clinical Department.

#### A CASE OF EPIDURAL INTRASPINAL ABSCESS OF PYOGENIC ORIGIN.

By W. J. MIXTER, M.D., BOSTON.

THE following case is reported in full on account of its rarity and also on account of my belief that there must be a few such cases, which, were they recognized and drained in time, would result favorably. It is a companion case to one reported herewith by Drs. Ayer and Viets.

Patient seen with Dr. J. W. Shaw of Newburyport, following a consultation with Dr. F. T. Lord of Boston, who advised exploratory laminectomy.

*F. H.*—Male, 17 years of age. *Family history* unimportant.

*Past History* negative except for furunculosis of face, which has been present to a greater or less extent since adolescence, and which has been quite severe during the past few weeks.

*Present Illness.* Sixteen days ago began to have pain in the left shoulder and about the left side of the chest, level of the fifth rib, increased on respiration. Also complained of sore throat. Was at home from school for a few days but did not see



his doctor. Improved enough to go back to school, but was still uncomfortable and evidently not in good health. Five days ago he was first seen by Dr. Shaw, as he had suddenly developed acute retention of urine. He was catheterized that day and examination of the urine was negative. There was no evidence of stricture or other obstruction. The next day he developed stiffness and weakness of both legs, headache, and stiff neck. The retention persisted. This was rapidly followed by a spastic paraplegia with temperature of 101°, and he was taken to the Anna Jaques Hospital. Lumbar puncture gave clear fluid not under excessive pressure with 2 cells per cc. Since then temperature has risen steadily and the paralysis has become complete in the legs. Seen by Dr. Lord last night.

*Examination* shows temperature 105, pulse 118, respiration 24, blood pressure 120, white count 30,000. Marked furunculosis of face. Throat somewhat reddened. General physical examination otherwise negative.

*Neurological Examination.* Conscious. Slightly confused mentally. Pupils equal and react normally. No choked disc. Other cranial nerves normal to hurried examination. Head held turned somewhat to the left. Neck stiff; rest of spine shows normal flexibility. No kyphos made out. Definite ataxia of hands (finger to finger and finger to nose). No motor or sensory paralysis of arms or hands. Arm reflexes not increased. Definite zone of hyperaesthesia from 7-9 D; complete anaesthesia below that level. Legs paralyzed, priapism, and retention of urine. Skin reflexes: abdominal not obtained. Cremasteric equal and normal on two sides. Normal plantar on left, Babinski on right. Tendon reflexes; knee and Achilles jerks not obtained. Kernig absent.

Lumbar puncture gave clear fluid with very faint yellow tint, not under pressure, which showed a definite coagulum on standing. Proteids greatly increased by ammonium sulphate and alcohol precipitation. Rare cell.

No x-ray was taken.

**Operation.** Laminectomy 3d to 6th dorsal inclusive. Beneath the epidural fat and outside the dura was found an abscess cavity cylindrical in shape running from the 3d cervical to the first lumbar vertebra and containing a large amount of creamy, greenish yellow pus under considerable tension. No evident focus of infection could be made out. The abscess cavity was drained with rubber and the wound closed rapidly. The patient died a few hours later. No autopsy was allowed. The pus showed a pure culture of staphylococcus aureus.

*Discussion.* A few words will suffice. By careful consideration of symptoms and signs it was evident that we were here dealing with transverse myelitis from an acute process; a pyogenic abscess was thought most likely, but the absence of knowledge of previous cases made us wary of exact diagnosis. The abscess found is to be considered, in my opinion, metastatic from the furunculosis or from tonsillar infection which was present in this case, in the same way that staphylococcus infection occasionally is found in perinephritic fat. The possibility of extension from an osteomyelitis of the vertebra must be considered, but the operative findings

make me feel that this was not the case; unfortunately, autopsy proof of this is lacking.

While extra-dural abscess formation of this type is rare, its importance is considerable, in that operation undertaken early should give in favorable cases relief from paralysis and bring about a cure. Certainly, the outlook should be considerably brighter than in cases where the abscess is secondary to infection of the spine.

Text-books on neurology and surgery are practically silent on this subject. Even in Elsberg's recent work, we fail to find mention of this type. It is for this reason that this case and the accompanying case of Ayer and Viets are here reported.

# INTRASPINAL EPIDURAL ABSCESS (PYOGENIC): CASE WITH AUTOPSY.

BY JAMES B. AYER, M.D., AND HENRY R. VIGGS, M.D.  
BOSTON.

[From the Departments of Neurology and Neuropathology, Harvard Medical School.]

THE two cases of epidural abscess of pyogenic origin here reported are worthy of consideration, not only because of the rarity of the condition, but because points of real diagnostic and therapeutic value are involved. True, both of these patients died, but there is nothing in either case which proclaims an unnecessarily bad prognosis for others of similar nature. Such a happy outcome was indeed obtained in one case reported by Raymond and Sicard.<sup>1</sup>

An exhaustive study of the literature has not been attempted, but a moderately thorough reading yields few references to the subject at hand. In Lewandowsky's *Handbuch*, where if anywhere one would look for light, references were found to but three cases falling into the group of epidural pyogenic abscesses, nor have we been able to fare better elsewhere. It should be here stated for clearness that from this group we exclude all cases of abscess primary in vertebrae or spinal cord; the condition here dealt with is this: *pus collection inside of spinal canal, but outside of the dura; its origin being metastatic or by direct extension; the organism pyogenic and not tubercular.*

Without further comment we will present our



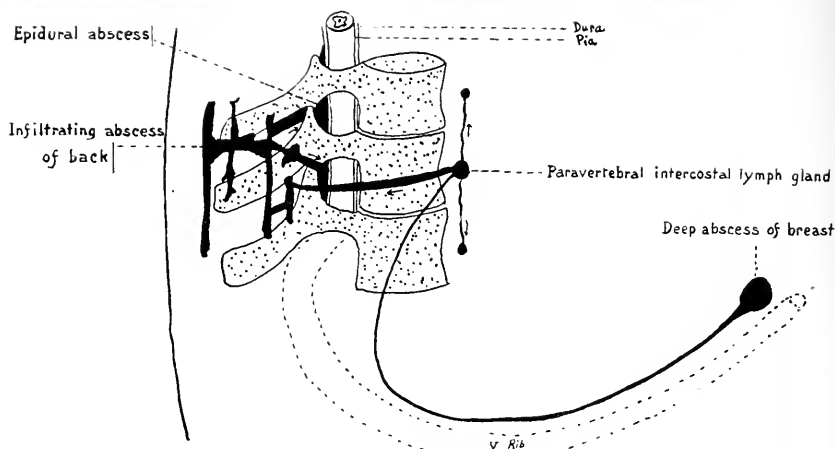


Diagram to show course of infection from deep breast abscess by intercostal lymphatic to lymph node; thence by direct extension to back muscles and epidural space.

had difficulty moving his legs, and by September 29 he was paraplegic, with urinary and fecal incontinence. Neurological examination showed, besides the almost complete paralysis of legs, a mild bilateral sensory disturbance below umbilicus; k.j. present, a.j. not obtained, plantars normal, abdominal and cremasteric reflexes absent. Head and arms not remarkable. Examination of the back showed some fullness only in dorsal region and crackling rales at bases of lungs. Lumbar puncture gave 4 cc. only of clear yellow fluid, under no excess of pressure; the fluid clotting almost immediately. In twelve hours the fluid separated spontaneously from the clot and was found to give a negative Wassermann, a gold sol in the "meningitis" zone, great excess of proteids, and to be sterile on culture; the clot was macerated, and examined for cells, one only being found.

In seven days the patient died.

*Abstract of Autopsy.* Five hours post mortem.

Just to the right and below right nipple is an area, 10 cm. in diameter, of granulation tissue; from it no pus can be expressed, nor is there any in the surrounding tissue. The first incision into the back, however, yields a thick greenish pus; investigating deeper and more extensively shows that this pus has infiltrated the trapezius, latissimus dorsi and erector spinae groups of muscles. Dissecting to the spinal column, pus is seen to well up between the vertebrae, and when the laminae and spines have been removed, a thick coating of pus hides the dura from view for a distance of 10 cm., corresponding to the fifth, sixth and seventh dorsal vertebrae. The pus is easily stripped from its position on dura and from the nerve roots which it surrounds, leaving the former perfectly normal in appearance. The dura opened reveals a glistening inner surface and a cord of normal appearance, but the spinal fluid in the lumbar sac is of yellow color and, as analysis shows, is similar to that withdrawn previously. Even on section the cord presents everywhere normal appearance and markings.

Turning now to the pleural cavities: both con-

tain a small amount of sero-fibrinous fluid and a few fibrinous adhesions, especially posteriorly on the right. On cutting through the pleura at this region pus exudes, and search shows that it comes from two sources, the erector spinae muscles and necrotic paravertebral intercostal lymph glands, the latter being affected more particularly in the neighborhood of the fifth dorsal vertebra.

Other post-mortem findings are inconsequential. Abdominal cavity normal, but pericardial cavity contains slight excess of fluid. Intestines, pancreas, liver, kidneys, adrenals, heart and aorta all normal. Lungs show congestion only. Lymph glands of mediastinum, roots of lungs and mesentery all normal in size and appearance in contrast with the paravertebral glands above presented. A section of the fifth rib half way between axillary line and vertebral attachment shows medulla yellow-red, and no abnormality of the periosteum. Spleen large and soft. Cultures: pus from the back muscle; pericardial fluid and fluid from right pleural cavity—*staphylococcus albus* in pure culture. Heart's blood, no growth.

*Microscopic Examination* was carried out in routine manner on the tissues of the body, without striking addition to the gross findings. Microscopic examination of the spinal cord is, however, of considerable interest and importance, and is here given. First to be noted is that there is no distortion of the cord in the region of pressure and the size of the cord is not diminished; in fact, sections at one level suggest an actual, though slight, enlargement of the cord, fibers being separated more than normal, with presence of vacuoles, the cord at this point to the naked eye giving a moth-eaten appearance. While there is no certain destruction of nerve fibers, such degeneration is suggested by the presence of a few phagocytic cells in the rarefied areas of the white matter. Throughout the white also, but more particularly near the rim of the cord, a moderate increase in number and size of neuroglia cells is seen, some with faintly-staining protoplasm; no evident increase of glia fibrils is to be seen. The gray



matter presents normal configuration; the anterior horn cells are present in correct number, but many present the axonal reaction. Vessels appear normal and there is no evidence of dilatation or cellular infiltration of perivascular spaces. The pia is of particular interest because of its proximity to the abscess, which is separated from it only by dura. The pia shows a slight cellular infiltration, and on close examination the cells are found to be largely fibroblasts with a few plasma cells and lymphocytes; no polynuclear leucocytes are seen in the pia. Nerve roots, both dorsal and ventral, show perhaps a slight increase in fibroblasts, but no evidence of exudative cells.

#### DISCUSSION.

As clearly as ever falls to our lot, we are here enabled to follow the sequence of events from August 20, the date of the original infection, to death on October 6, which for clearness may be summarized: infection of skin of breast by a nail, leading to deep abscess formation; extension by intercostal lymphatics, chiefly fifth, to intercostal paravertebral lymph nodes, with destruction of the fifth, and subsequently one or two more, while at the same time the *point of infection heals*; infection then proceeds by continuity, at first causing a sero-fibrinous pleuritis, not leading, however, as would be expected, to lung abscess, but proceeding backward into the deep muscles of the back; thence upward and downward in these, and also inward between vertebral spines and intervertebral foramina until sufficient pus had accumulated over dura mater to cause pressure on spinal cord and symptoms of "transverse myelitis." The organism concerned is staphylococcus albus. (The accompanying diagram gives, in graphic form, the route of infection.)

Knowing the case as we do now, could surgery have helped? It is unlikely that anything could have been attempted until September 26, when the patient first complained of his back, the first indication that these back muscles had become infiltrated; the second warning, and one which the writers would now consider of great importance, is the onset of cord symptoms of the nature of a transverse myelitis, but especially the accompanying findings in the spinal fluid, namely, the "*syndrome de coagulation masive et de xanthochromie*." Such findings in the spinal fluid are, in the belief of many,—Froin<sup>3</sup> who described the fluid in 1903, of Raven,<sup>4</sup> Nonne,<sup>5</sup> of Mestrezat,<sup>6</sup> and others,—almost pathognomonic of pressure on spinal cord; the authors<sup>7</sup> have themselves recently reported a series of such cases, and are in hearty agreement as to its significance. It is not unlikely that even at this time surgery could have benefited if generous laminectomy had been performed.

Turning to another aspect of the case, it is interesting to note the efficiency of the barrier to infection presented by the dura. Pus must have lain on the dura under considerable pressure, if we may judge from symptoms produced and its configuration at autopsy, for at least

nine days, and yet no infection of the cerebro-spinal axis had taken place, as proved by negative culture, taken during life, and absence of cells characteristic of acute inflammation at autopsy. We know that the lymph stream is outward from the spinal canal, and yet it is astounding that under pressure this direction should not be reversed in all this time. Even more striking in this regard was the case of E. A. Oppenheim,<sup>8</sup> who reports a case of similar nature in which pus had pressed upon the dura for 25 days without subdural infection! The changes within the cord are interesting; though no true infection of the cord has taken place, there is already evidence that a breaking up of the cord is under way, as evidenced by the phagocytic cells found in this substance, by the axonal reaction of the anterior horn cells, and by the proliferation of neuroglia suggestive of attempt at repair.

We wish to express our thanks to Dr. Nathaniel S. Hunting of Quincy and Dr. Walter E. Paul for clinical data in connection with this case.

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## Medical Progress.

### REPORT ON OBSTETRICS.

By ROBERT L. DE NORMANDIE, M.D., F.A.C.S., BOSTON.

#### ABDOMINAL PREGNANCY.

SOLOMONS<sup>1</sup> reports a case of abdominal pregnancy which occurred in his practice, with a brief review of the causes and treatment. He defines abdominal pregnancy as a development and growth of the fetus in the abdominal cavity, which may be either primary or secondary. He regards a primary abdominal pregnancy as unlikely, and thinks that secondary abdominal pregnancy is more credible.

He regards the diagnosis of abdominal pregnancy as extraordinarily difficult, making note of the fact that various men have tapped the abdomen, thinking that these cases of abdominal pregnancy were ovarian cysts. The diagnosis of this condition may be established by the following points: the extreme sensitiveness to palpation; there are no intermittent contractions; the irregularity of the outline of the



tumor; the fetus is directly under the skin, and the heart sounds are directly under the ear; a further point is that retroversion is a common accompaniment of this condition.

He records the history of a patient, a woman of thirty-three, married ten years, who never became pregnant until the present instance. Her last menstruation was early in July, and she was admitted to the hospital on December 31. Four months before admission to the hospital she had pain in the abdomen, which gradually increased until it became unbearable. She suffered from dysuria. Examination of the abdomen showed a mobile tumor, dull on percussion, fairly regular in outline, extending to the umbilicus. Bimanual examination showed the cervix to be retroverted. The tumor in the abdomen seemed connected with the cervix, yet there was a soft, cystic swelling in the front and lateral fornices, and this was also connected with the abdominal tumor and cervix. Fetal parts and movements were distinguishable, both abdominally and by the vagina. Solomons said he could not make a definite diagnosis, and he determined to open the abdomen. He opened the abdomen and found a tumor, hemorrhagic in appearance, stretching a little beyond the umbilicus. Separating the adhesions between the tumor and the intestines in the omentum, a finger entered the amniotic sac and a fetal foot appeared. There was much hemorrhage, which was stopped by oversewing. He removed the fetus and placenta, and with it the right tube. The uterus, left tube and both ovaries were left *in situ*. He found the uterus lying retroverted, practically imbedded in the tumor which filled the pelvis. The patient was in poor condition, and he closed the abdomen as quickly as possible. The abdominal wound healed by first intention, and she was discharged from the hospital in good health on the twenty-sixth day.

Solomons makes a few remarks on the treatment of abdominal pregnancy from the time when the condition was first found post mortem, next until treatment was postponed until after the death of the child, then when the child was removed and the placenta was left. There is a review of the literature, and from his own case he feels that the rational treatment is to remove the fetus and placenta and to stop the hemorrhage, and that it is bad policy to leave the placenta *in situ*.

There is a short bibliography at the end of the article.

#### THE APPLICATION OF ANOCI-ASSOCIATION TO OBSTETRICS.

Hoag<sup>2</sup> has been studying a number of cases where the anoci-association principles were applied in obstetrics, combining with the principle, nitrous oxide and oxygen, chloroform and ether, or chloroform alone with the anoci-association. Combined with some of his cases he used scopolamine. In all cases the perineum was injected

with a 0.25% novocaine, in varying amounts from 50-160 cc. Eleven patients he gave in addition 30-40 cc. of 1% quinine-urea solution. The maximum amount of the two solutions injected in any one case was 175 cc. An injection was made as the head appeared in sight. The vulvar edges were turned back, and a long needle was inserted at the muco-cutaneous border. Novocaine was injected first and the quinine-urea immediately afterwards. By this technique, he says, the levator-ani and the perineal body can be readily infiltrated. He tabulates his cases under three groups: first, those that received nitrous oxide, scopolamine and perineal injections; second, those that had nitrous oxide and chloroform or ether with scopolamine and perineal injections; third, those that had chloroform only for delivery, no scopolamine, but had perineal injections.

He concludes that nitrous oxide analgesia is safe to both mother and child, and the use of limited amounts of scopolamine during the first stage is a distinct advantage, shortening the time during which gas is required, and making the analgesia more complete. He believes that the injection of the perineum is a distinct help in securing relaxation of the outlet, and he feels that there is no complication whatsoever resulting from the perineal injections. The combined use of scopolamine, nitrous oxide oxygen and local infiltration offers a practical and efficient means of conducting labor, and extends "anociation," in its broadest sense, to the obstetrical field.

#### PERINEAL ANALGESIA IN LABOR.

King<sup>3</sup> reports his experiments at perineal analgesia in a very interesting illustrated article. His technique is as follows: First, he uses 2% solution of novocaine, sterilized by boiling. To this solution he adds one-third of a minim of 1:1000 solution of adrenalin chloride to each em. He then palpates the pubic arch to be sure of the landmarks where the injection should take place, and this he clearly shows in the diagrams. The anterior injection is made 2-4 cm. below the vagina and 2 cm. from the rami of the pubis. The needle is passed 2-4 cm. in depth, corresponding to the level of the hymen. The expression of sudden pain as the needle meets the positive resistance of Colles' fascia, indicates the proper depth. The posterior injection is midway between the anus and the tuberosity, with the needle inclined, and injection takes place at about 4 cm. The injections are made bilaterally. Primiparae, he states, require only anterior injection, while multiparae require both anterior and posterior injections.

He summarizes his paper by saying that in nearly one hundred injections no adverse results have followed. Analgesia begins in a few minutes, and is prolonged two to four hours. Lacerations are diminished in number and ex-



tent, for the consciousness, without pain, of the patient, allows retardation or advancement of the presenting part at will, thereby developing the fullest elasticity possible. Hemorrhage is greatly diminished, due to adrenalin and lessened extent of tears. The repair of the tears is greatly facilitated because of the anesthesia, and when the posterior triangle is infiltrated, all the obstetric area can be rapidly and painlessly sterilized by iodine under this preparation. He finally states that the general practitioner can safely and easily apply the method at the bedside.

#### A STATISTICAL STUDY OF 635 LABORS WITH THE OCCIPUT POSTERIOR.

After a very thorough analysis of 635 labors where the occiput was posterior, Plass<sup>4</sup> comes to the following conclusions:

1. The frequency of occiput obliquely and directly posterior positions was 11.57% in the series (7500 cases).
2. Rotation of the occiput into the hollow of the sacrum occurred in 14%.
3. Three factors which tend to favor rotation into the hollow of the sacrum are, poor flexion, small size of the head, and funnel pelvis. Contractions of the pelvic inlet favors anterior rotation.
4. The etiology of internal rotation is not satisfactory; but Hodge's theory of the ischial spines and inclined planes is most acceptable.
5. Premature rupture of the membranes was not especially frequent when the occiput was posterior.
6. Spontaneous delivery was the usual outcome. The total operation incidence was 22.9%, but in only 11.02% was the position possibly accountable for the need for intervention.
7. There was no increased infant mortality because of the posterior position.
8. Labor was not prolonged, independently of whether the occiput rotated to the symphysis or in the hollow of the sacrum.
9. A contracted pelvis did not increase the incidence of the posterior positions.
10. There was no additional maternal morbidity or mortality.

#### CARE OF THE PERINEUM.

Plass,<sup>5</sup> in order to determine whether routine antiseptic treatment of the perineum after delivery had any beneficial effect upon the course of the puerperium or upon the healing of primary perineal repairs, carried out the following clinical experiment:

All patients delivered from November, 1911, to August, 1915, were divided alternately into two groups, A and B. Group A were given the routine perineal care with antiseptics. Group B were given no special attention. The routine perineal care consisted in bathing the vulva and perineum with cotton pledgets soaked in 1:2000

bichloride of mercury solution every four hours, as well as after each defecation and urination for the nine days the patient remained in bed. In Group B the patients were merely kept macroscopically clean with warm tap water and soap and a wash cloth. Unless the patient was very ill, she was expected to clean herself. In this group Plass found the average number of cleansings necessary were four a day for the first three days; from the third to the sixth day not more than two a day, and after this only one.

The results obtained by the two methods Plass tabulates in two tables, and from these tables he concludes that the routine care was followed by many poor results, whereas excellent results were obtained by the new method, and, therefore, the use of antiseptic solutions in the care of the perineum is of no value; macroscopic cleanliness alone giving better results. In addition, he says that much economy in the time of the nurses is obtained.

#### POST-MORTEM CESAREAN SECTION: A REPORT OF TEN CASES.

Harrar<sup>6</sup> reviews the early cases of post-mortem Cesarean section reported, noting that in 107 reported cases no living child was extracted. In 1914 Hallman reported 68 cases, with 61.68% of living children. Harrar advises against post-mortem version or forceps, unless the death of the mother occurred during the second stage of labor.

Harrar advises the physician to secure the consent of the husband or the family if instantly at hand, but he says if consent is not obtained and the fetal heart is still going, it is not only permissible, but imperative, for the physician to do all he can to save the child. Bacon has shown that Cesarean section is legal without consent, and must be done if the child is viable and alive.

The ten cases which Harrar reports occurred, are from the clinic of the Lying-in Hospital. Of these ten cases, three babies were still-born. Four babies were born with hearts feebly beating, but with no attempts at respiration. One baby gave a few feeble gasps and died. One baby, slightly asphyxiated at birth, died on the sixth day of pneumonia. One baby, badly asphyxiated at birth, left the hospital living and well, and one cried at delivery and was discharged well.

#### DOES ADMINISTRATION OF PITUITRIN TO THE MOTHER PRODUCE DIFUSE STROKES IN THE INFANT?

Heard<sup>7</sup> raises the question, whether the administration of pituitrin to the mother can cause nervous lesions in the infant. He reports three cases in full where the infants shortly after birth showed evidences of extensive cerebral injury, due, Heard thinks, undoubtedly to the birth. These three cases were not first born.



in no case was there any constitutional disease on the part of either of the parents or of the children; in no case was there any question of a prolonged or difficult labor; in each case a precipitate delivery was effected by pituitrin.

Heard concludes: (1) that the improper use of pituitary extract in labor is a cause of cerebral or meningeal hemorrhage in the newborn; (2) that hemorrhages in the nervous system of the infant, resulting from the use of pituitrin in labor are productive of diffuse nervous lesions so extensive as to result in early death, or if the child survives, in the terrible afflictions of paralysis, epilepsy and idiocy; (3) that cases presenting nervous lesions resulting from birth injuries should be carefully investigated as to the possibility of pituitrin having been a factor in the causation.

#### RUPTURE OF THE SCAR OF A PREVIOUS CESAREAN SECTION.

Findley's<sup>8</sup> article on rupture of the scar of a previous Cesarean section is based on his review of the literature of the subject, out of which he has found sixty-three cases of rupture of the scar. He says that when he began his review he had prejudice in favor of repeated sections, but as the work developed he concluded that such a position was untenable.

The greatest factor in the production of insecure wound healing is septic infection. He admits that there is no positive assurance of obtaining a perfect wound healing, whatever the method of suturing or whoever the surgeon. The uterine scar is an unknown factor in all cases. The transverse fundal incision has given more than its share of ruptures, and as yet it is too early to state how well the scar in extra-peritoneal and cervical sections will stand repeated pregnancies and labors.

The sixty-three cases which he found are carefully tabulated and analyzed, and his conclusions are:

1. A perfectly healed Cesarean wound may be relied upon to resist the forces of labor, but in view of the fact that the integrity of the wound is an unknown factor in all cases, we are constrained to exercise the utmost caution in the conduct of every case in pregnancy and labor following Cesarean section.

2. Failure to secure perfect healing of the uterine wound is because of departure from the principles of suture proposed by Sanger, or because of septic infection.

3. Latent gonorrheal infection may defeat the most painstaking effort.

4. When a Cesarean section has been followed by a fever course, the uterine wound should be regarded as insecure, and should call for a repeated section at the onset of labor.

5. Sterilization and hysterectomy should replace conservative Cesarean section when infection is known to exist.

6. The possibility of rupture of the scar following Cesarean section does not justify sterilization. In subsequent pregnancies the labors should be hospital cases, and if the wound is known to be defective, then a repeated section should be done.

7. Version, high forceps, hydrostatic bags and pituitrin should never be used in the presence of a Cesarean scar.

8. There is evidence that not more than 2% of ruptures occur in subsequent labors, and that, therefore, we are not justified in voicing the slogan, "Once a Cesarean section, always a Cesarean section."

Findley finally adds, however, that the liability of rupture is real, and, therefore, this should stand as an argument against the increasing tendency to widen the scope of elective Cesareans.

A long bibliography follows this article.

#### MEDDLESOME MIDWIFERY IN RENAISSANCE.

From DeLee's<sup>9</sup> article one gathers that at the present time there is much meddlesome midwifery going on throughout the country. He feels that the average physician does not give to the cervix its proper importance, and that the serious tears that the cervix is subject to are a cause of much invalidism.

He feels that the notion which the public and the profession have entertained for many years, and which is becoming more prevalent among the profession of late, that natural labor should be curtailed as much as possible, is explained partly by the agitation in the lay press for the relief from suffering of childbirth. He says that methods to shorten the time of labor have been multiplied, and great virtues have been claimed for them. He says that, without doubt, protracted and painful labor does weaken the parturient, but that there are no permanent effects from this. The amount of surgical trauma determines the smoothness of recovery even more than the stress of the nerves. DeLee calls attention to some of the most common evils which have gained footholds in obstetrics. The first he notes is the attempt to cut short the period of dilatation of the cervix. Manual dilatation, he says, always tears the cervix. Colpeurynters often do, and almost invariably do, if traction is put on them. In addition, they pull the cervix downward, while the uterine action pulls it upward. The danger of infection attends all these manoeuvres, though he says it is true that women seldom die of sepsis, but the morbidity, immediate or postponed, is high. Another form of interference is the indiscriminate use of twilight sleep, gas and oxygen, and other anesthetics. DeLee says that he, himself, uses anesthetics too often and too liberally, and that this increased use of anesthetics has increased the number of forceps operations, lacerations and post-partum hemorrhage in his



own practice. He further warns the physicians against allowing the parturient to bear down before the cervix is fully dilated, for by this the cervix is dislocated and much damage follows. He warns against too frequent vaginal examination and the "ironing out of the perineum." He favors the use of rectal examinations, and states that with little practice great efficiency can be obtained. He regards the giving of pituitary extract the most dangerous of all the meddling practices. He refers to sixteen cases of rupture of the uterus that are on record, and states that hardly a month goes by but that he learns of cases in which the baby has been lost after the use of pituitary extract. He demands that pituitary extract be used only in the presence of a really scientific indication.

He again repeats the charge that the abuse of obstetric forceps is real, and he deplores the fact that often the indication is "bed-time, office hours or some other set appointment." DeLee makes another interesting point, that Cesarean section is too frequently performed, commenting on the fact that in some communities it seems that the only method of solving difficult obstetric problems is to cut them.

#### PUERPERAL GANGRENE OF THE EXTREMITIES.

Stein,<sup>10</sup> in a very complete article in which he has given abstracts of all the cases that he can find up to the present time of puerperal gangrene of the extremities, reviews the etiology, symptoms, prognosis and treatment of this serious complications of the puerperium. He also reports two cases of his own. His first case was that of a woman who had a septic abortion at three months. The temperature varied for six days in the puerperium between 104 and 105°. Stein examined the patient on the seventh day, and he decided to curette her, as the uterus was still enlarged and soft. After the curettage, the interior of the uterus was swabbed with tincture of iodine, and this was repeated the next seven days. Even after the curettage, the temperature did not drop, but kept between 101 and 102°. Seven days after the curettage the patient began to complain of pain in the right leg, and three days later the right leg and foot began to swell, became cold and showed bluish discoloration. Pulsation in the dorsalis pedis artery was not felt, and the foot was extremely painful to the touch. The line of demarcation became marked, and three days later amputation was performed below the knee. The patient then recovered.

His second case was a patient delivered at term by forceps. Had a second degree laceration repaired with chromic catgut sutures. Two days after delivery patient had slight chill, with temperature of 104.5°. Temperature varied from 101 to 102°. Six days after the delivery, sutures were removed because the whole area was sloughing. Patient continued to run a temperature varying from 103 to 104°, and, in spite of her very serious condition she left the

hospital, against advice, twelve days after delivery. She was readmitted seven days later with a temperature varying between 102 and 104°. Examination revealed both feet symmetrically discolored for a distance of about four inches above the ankles, and were nearly black and the skin was shrivelled. Both feet were extremely tender on touch, and in some places showed vesicles filled with a whitish fluid. Even though the line of demarcation was well pronounced, the patient's condition did not permit of any operative interference, and she died on July 19, five weeks after the delivery. No autopsy was obtained.

Stein says that the arterial origin of peripheral puerperal gangrene is probably the most common, and is probably always due to infection. Thrombosis of the arteries of the leg might be due to an ascending thrombosis of the uterine artery. The smaller blood vessels sometimes become obliterated through embolic plugs, which often become detached from the thrombi in the large arteries. In favorable cases, onset of gangrene is prevented by the establishment of compensatory collateral circulation. Stein says it is not clear why, in certain cases, the septic process becomes localized in the internal wall of an artery, and in other cases in the venous wall, or in both. The most common cause of peripheral gangrene is known to be a septic endarteritis and embolism from diseased heart valves usually occurring in cases of grave puerperal pyæmia. Mechanical factors, recumbent position and relative immobility of the entire body may also enter into the cause. The majority of these gangrenes concern the lower extremities, although the upper extremities are occasionally involved. In regard to the symptoms, pain is very pronounced and never absent in extensive vascular obliterations such as lead to peripheral gangrene. The ordinary symptoms of puerperal fever are present in the majority of cases, and sudden onset usually points to embolism in the arterial system, while, on the other hand, the gangrene may develop very insidiously in the case of a small embolus. The absence of arterial pulsation below the thrombus is an important sign. The sensibility is usually distinctly diminished, while mobility may be preserved. A livid discoloration and a relatively diminished temperature of the affected area add to the probability of incipient gangrene. The prognosis of puerperal peripheral gangrene is governed by the time of the performance of amputation. Unfortunately, amputation is not always practicable on account of the patient's bad condition or because the seat of the obstruction is located high up in the aorta. One-half to two-thirds of the patients die. The treatment consists of purely conservative measures and the appearance of the line of demarcation is a signal for amputation. Prophylaxis is that of ordinary aseptic and antiseptic management of all deliveries.



## POSTURE IN OBSTETRICS.

In an illustrated article, Markoe<sup>11</sup> shows the development from ancient times of the so-called obstetric chair. He says in the development of the use of forceps the necessity of posture was gradually lost sight of, so that at the present time but little is said in its favor. Markoe feels that the first stage of labor should be observed more carefully than it has been in the past, and that obstetricians, both in the hospital and in private practice, should exert their efforts to make this stage as short as is compatible with perfect safety. He feels that posture is of great assistance, and it is because of his desire to make use of this procedure that he first revived the so-called obstetric chair. His method is as follows:

When regular contractions have been established, the patient is instructed to conserve her strength by not remaining too long in one position, but to sit from time to time in the chair, with the knees elevated so that they support the enlarged abdomen and to have the chair so padded with pillows and blankets that the maximum of comfort is offered. By thus sitting in a chair as he has depicted it—a rocking-chair can be used—the weight of the uterine contents is exerted on the cervix, not in a harmful way, but with a steady hydrostatic pressure that at this stage does more to shorten the labor than anything else. If the patient becomes restless in the chair, or the contractions are severe, she may with benefit walk about the room, or even recline. The inclination of the chair, he says, is of the greatest importance, for by changing this inclination the axis of the uterus may be made to point directly into the pelvis. Markoe says that since he has used the chair he has performed fewer operations, such as Cesarean section, versions and forceps, and that there is a decrease in the deaths of mothers, fewer stillbirths and fewer deaths of the child following labor. As far as perineal lacerations go, it has apparently made no difference with them. In his article there are various tables which show the length of time which the patients were kept in the chair, the various abnormal conditions met, and the results obtained.

## ACCIDENTAL HEMORRHAGE.

Wing<sup>12</sup> reports two cases of accidental hemorrhage upon which he did Cesarean section.

The first patient, a primipara 7½-8 months pregnant, twenty-two hours before admission to the hospital, fell heavily against the bathtub, striking her abdomen. Abdominal discomfort followed at once, and in three or four hours the patient was having severe abdominal pains, with cramp-like exacerbations. Ten hours after she fell she began to bleed by vagina.

When examined at the hospital she was nearly exsanguinated; slight bleeding from the vagina. Cervix barely admitted a finger, and no placenta was felt. The uterus was of the size corresponding to a pregnancy of eight months and

was tonically contracted, having the consistency almost of wool. No fetal heart heard.

Cesarean section was determined upon, and when the uterus was exposed it was found firm, somewhat distended, much deeper in color than normal and showing numerous petechial areas. The uterus was incised and the placenta found in the region of the fundus, almost entirely separated. The dead fetus, placenta, membranes and clotted blood were removed and the uterus closed. The uterine muscle seemed softer than usual and deeper in color, and it bled scarcely at all. Twenty-four hours after operation, the patient was transfused because of her poor condition. Improvement followed, and she was allowed to go home on the twenty-second day. Twenty days after leaving the hospital she returned with an attack of erythema nodosum, from which she recovered.

Wing's second case was also a primipara in about the eighth month of pregnancy. Fifteen hours before admission to the hospital she began to have slight labor pains. Seven hours before admission bleeding from vagina occurred. A physician who was called, packed the vagina with iodoform gauze, and referred her to the hospital some hours later.

On admission her general condition was good. Fetal heart, 140. The uterus was very firm, and remained more or less tonically contracted. Cervix thick and barely admitted a finger tip. No placenta felt. The uterus was tender. It was noted that the head, which was above the brim, moved laterally when the uterine contractions occurred, in the direction of the left iliac fossa. Wing, on watching this patient, explained this peculiar lateral movement of the child by some cord entanglement, and that the bleeding was due to a partial separation of the placenta. Wing decided upon a Cesarean section, and he found the cord twice around the neck, and its insertion in the placenta was almost marginal and at the lower border. The child was born alive and did well.

Wing's explanation of this accidental hemorrhage is that the short cord pulled off a portion of the placenta. A diagram of the condition found accompanies the report.

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## INDUSTRIAL HEALTH INSURANCE.

THE subject of industrial health insurance, now interesting a considerable proportion of the medical and legislative community, is novel to most persons in this country, but is far from being a new social phenomenon. It was established in England before the outbreak of the European War; in Germany as early as 1883; and in Russia rudimentary attempts in the same direction were made in 1806 to protect the health welfare of industrial workers. The appearance of the problem, therefore, in our own community is to be looked upon as an inevitable evolutionary step. The compensation of working men for injuries received in the pursuit of their occupation has already been established in this country, though many of the details of its administration are not as yet satisfactorily adjusted; and experience has shown in other countries, that where once the policy of neglecting disease or leaving its care to private interests has been abandoned, a complete series of social health legislative measures has ultimately been

adopted. Viewed in the historical perspective, therefore, it appears now that the problem of industrial health insurance and other forms of medico-social legislation should be met by the medical profession in a spirit of friendly criticism, recognizing their intrinsic justice and desirability, and endeavoring to profit by the experiments of others in securing such conditions and details of administration as shall make such acts equitable and beneficial to all.

In last week's issue of the JOURNAL we published the text of the Dotten Bill, a measure of industrial health insurance introduced before the Massachusetts General Court at its latest session, and now under consideration by the recess legislative committee. Closely similar bills have been introduced into the legislatures of about twenty other states. In the same issue we published an expository editorial, aiming to point out in brief the leading propositions of this bill and their relation to the medical profession. This publication was in no sense intended as an endorsement of the Dotten Bill. While recognizing the desirable principle of industrial health insurance, we doubt that this bill, or any other bill hitherto drafted, would satisfactorily secure the benefits of this principle for the community. The present purpose of the JOURNAL is to foster and encourage frank and open discussion of the entire problem, and to this end it has planned to devote its issue of December 21 to a symposium of articles, dealing with various aspects of the subject from several points of view. In subsequent issues its columns will be freely opened as heretofore, to contributions and discussions, presenting different standpoints and opinions. The question is many-sided, and it is only by its temperate and careful discussion, in a spirit of amity and genuine interest for the common welfare, that the best solution can be profitably attained.

## SHOCK AND LOW BLOOD PRESSURE.

IN a remarkably graphic and lucid article, published in another column of this issue of the JOURNAL, Dr. W. T. Porter of Boston records the interesting results of his personal investigations last summer into the subject of shock, as observed at the front and in hospitals immediately behind the fighting line in Europe. His vivid narrative not merely presents accurately



the conditions under which he sought to determine the genesis of shock, but illustrates admirably the fact, not often made obvious in medical papers, of the romantic interest attaching to scientific research when its object has so direct a bearing on clinical medicine.

The outstanding fact resulting from Dr. Porter's observations in France, correlated with his previous experimental study of shock in laboratory animals, is that shock is essentially a vaso-motor phenomenon associated with a persistent lowering of the diastolic blood pressure to 50 millimeters or less. The possibility of recovery from shock is dependent upon the possibility of restoring this pressure to within normal limits. The patient suffering from this condition, unrelieved, dies essentially of splanchnic, or intra-portal, hemorrhage.

Dr. Porter points out not only these facts, and the causes by which the condition of shock is induced under the circumstances of warfare, but also the remedies by which it may be successfully combated. These are, briefly: posture, warmth, intravenous infusions of normal saline solution and of adrenalin, and blood transfusion. Individually, these methods have doubtless been known and practised by many surgeons. It seems hardly likely, however, that they have been consistently practised in sequence in the treatment of surgical shock as seen under the circumstances of civil practice, where, of course, the physiologic and pathologic phenomena of shock are the same as in warfare, though the etiology may differ. The two important facts of Dr. Porter's paper are its clear presentation of the genesis, nature and rationale of treatment of shock, and its exemplification of the possibilities of valuable service of scientific methods in elucidating the problems of clinical medicine and pointing out the way for their solution.

#### PROGRESS OF POLIOMYELITIS.

DURING the past week there has been a slight recrudescence of poliomyelitis in Massachusetts. One new case was reported on December 9, making a total of 18 cases during the first 9 days of the month. The numbers of cases during the preceding months in Massachusetts were: July, 107; August, 252; September, 623; October, 702; November, 179.

Report from St. Paul, Minn., on December 1, states that Dr. E. C. Rosenow, working at the Mayo Clinic with Dr. E. B. Towne of Boston, and Dr. G. W. Wheeler of New York, has isolated a polymorphous streptococcus from the tonsils and pharynxes of over fifty patients in the acute stage of poliomyelitis; and that with cultures of the larger forms of this organism, the disease was consistently reproduced in susceptible animals. The authors are reported as saying of these observations: "The exact relation of our results to the facts already established as to the etiology of poliomyelitis cannot yet be definitely stated. It appears to us that the small filtered organism which has been generally accepted as the cause of poliomyelitis, may be the form which this streptococcus tends to take under anaerobic conditions in the central nervous system and in suitable culture media, while the larger and more typically streptococic forms, which investigators have considered contaminations, may be the identical organism grown larger under suitable conditions."

Report from Washington, D.C., on December 2 states that a resolution has been drafted for immediate presentation to Congress, calling for an appropriation of \$250,000 to be expended by the United States Public Health Service on an intensive study of poliomyelitis. The weekly report of the Service for November 24 records a general decline of the disease throughout the United States. During the month of October the largest numbers of cases outside of Massachusetts were: 254 in New Jersey, 250 in Pennsylvania, 238 in New York exclusive of New York City, 148 in Minnesota, 143 in Illinois, 120 in Maryland and 84 in Wisconsin.

Apart from continued research into the etiology and transmission of the infection, the most important problem now connected with the epidemic of poliomyelitis is the after-care of convalescents from the disease. In previous issues of the JOURNAL we have noted the beginning already made in Boston in the special clinic established at the Children's Hospital. Similar work is being done at the Massachusetts General Hospital, and at other large clinical centers in the State. In New York, where exists the largest group of these patients demanding attention, the problem is in the hands of a committee on the after-care of infantile paralysis, which was organized as the result of a series of conferences, called by Dr. Haven Emerson. It



is not desirable that after patients are dismissed from quarantine, they should pass out of the jurisdiction of the health department. The following description of the organization and work of the committee is quoted from the weekly bulletin of the New York Health Department as a valuable outline of the method adopted in dealing with the after-care of poliomyelitis in that city:

"The committee has undertaken three main lines of work: first, to coordinate the work of the dispensaries and nursing agencies, so that no child should want or wait for treatment; second, to organize dispensary transportation for all the children who needed it; and, third, to raise funds to aid in the treatment, home care and training of these children.

"To accomplish the first of these, the committee divided the entire city among the following four home-visiting agencies: the Committee on Crippled Children of the Brooklyn Bureau of Charities, the Henry Street Settlement, the Association for the Aid of Crippled Children, and the Bureau of Educational Nursing of the New York Association for Improving the Condition of the Poor. To November 16, 5409 children had been referred to these agencies, and largely through their efforts 3288 of these were reported as being then under treatment, either with private physicians or in the dispensaries. In addition to these, 86 cases have been referred to the social service department of the New York Hospital, where the patients had been as acute cases; 85 of these are reported as having begun treatment. Among those reported as under treatment is a small number who have no residuary paralysis, but are being examined occasionally so that no deformity may unexpectedly develop. The visiting nursing agencies also do the dispensary social service work where it is not otherwise provided.

"While the city was easily divided among the nursing agencies, it has been difficult to divide it among the dispensaries. Many things had to be considered,—equipment, personnel, location, local need, transportation, preference of parents, etc. As a matter of fact, most of the patients are being cared for by about twenty dispensaries, while half of that number are doing most of the work. The committee is still trying to group the cases about the best dispensaries and into districts convenient for transportation.

"To accomplish the second of these purposes, the committee secured and operated a small number of ambulance busses and motors, on its own account and through the cooperation of the Sick Children's Transfer Society, the Social Service Department of Bellevue Hospital, the Forward Fund and the Militia of Mercy. The Board of Estimate and Apportionment has made a small appropriation to the Department of Charities to provide transportation to and

from the dispensaries, where necessary, and it is hoped that eventually the transportation will be fully provided by the city. In the mean time, the committee will continue its service and will doubtless find it necessary to supplement the city's transportation in special cases.

The agencies upon which the burden of after-care fell did not hesitate for lack of funds to begin work. But it was soon found that they must have additional funds. Either they must raise them through separate appeals, or the Committee on After-Care must raise money for them. While this question was pending, the Public Health Committee of the Academy of Medicine and the Associated Out-Patient Clinics recommended that the Committee on After-Care take this opportunity to promote the best standards of equipment and personnel in the dispensaries engaged in after-care. Accordingly, a budget was prepared, and a large citizens' finance committee was appointed to raise money for the treatment, home care and training of these children. The committee is asking for a quarter of a million dollars, which, however, will not care for them till they are recovered, but will carry the work into, if not through, the second year. None of this money will be used for the administrative work of the committee—this cost having been met by the Rockefeller Foundation—but will be used only for after-care, first of all through established needful and satisfactory agencies, and second, to encourage new ones where the children of a locality cannot be conveniently treated otherwise. At the request of the Commissioner of Health, the Committee on After-Care will administer the brace fund, raised by the Department of Health as a result of public appeals.

"The Committee on After-Care consists of a general committee, representing the Department of Health, the Department of Public Charities, the hospitals, dispensaries, nursing associations, and other welfare agencies; a Committee on Transportation, comprising more than a hundred names; a Medical Council of twenty-one orthopedists, neurologists and pediatricists; and a Finance Committee of two hundred men and women."

## HEALTH AND SANITATION IN THE NAVY.

THE recently published annual report of the secretary of the United States Navy records the work of that national department for the fiscal year ended June 30, 1916, but includes operations and recommendations to December 1 of this year. Particular attention is directed to the section of the report dealing with health and sanitation in the navy, to which an especial medical interest attaches. In this section it is



pointed out with how much care the personal health and welfare of young men in the navy is safeguarded. As a matter of fact, during the past year the death rate of the naval personnel was only 4.48 per thousand, whereas the death rate of men in the same age period, exposed to the ordinary hazards of civilian life, was 8 per thousand.

"Incident to the nature of a seafaring life is, of course, the constant menace of drowning, and of our total deaths, 51, or one-sixth, are due to this cause. Of these, however, 21 are those who went down with the *F-1*.

"It is noteworthy that the three predominant causes of death—drowning, tuberculosis, and pneumonia—all show, upon analysis, encouraging improvement over preceding years. Tuberculosis, also, as it is handled in the navy, is found less frequently in naval than civilian life. To quote statistics again, our civil population between the ages of 15 and 60 years owes 30% of its total deaths to this disease; naval mortality during 1915 owes 11% of its deaths to this cause, and this is being materially bettered each year.

"The activities of the medical department of the navy during the past year have been unusually marked. Naval and military developments of this unprecedented epoch of military history are constantly being observed, and proper use made thereof in the plans and activities of our own service. Our medical officers detailed for observation purposes with the warring powers are informing themselves of all facts available pertinent to the medico-military aspects of naval life."

After a brief discussion of the medical activities of the navy in Haiti and Santo Domingo during the past few years, the report emphasizes, as follows, the indispensable importance of the hospital ship and the nature of the personnel of enlistments in the navy:

"The usefulness of a hospital ship as a necessity in modern warfare has been emphasized by the European conflict; and the naval act of this year, besides increasing the Medical Corps from 347 officers and 1500 men to 600 officers and 3000 men, besides facilitating advancement in the Hospital Corps from the lowest enlisted rating to that of actual commissioned officer, and besides increasing the total appropriation for the medical department from \$682,000 last year to \$1,187,728 for the current year, has led the navies of the world in authorizing the construction of a model hospital ship, which will be a veritable *Bellerophon* afloat. The war across the Atlantic has demonstrated the value of the hospital ship. The British alone employed over 40 ships of this class during the Gallipoli cam-

paign. These ships and the ships employed by other nations, however, were designed for other purposes, and hastily converted to meet the emergency. The new hospital ship being constructed by the Philadelphia navy yard will be an oil-burner, with all that this means for comfort and cleanliness. A stabilizer will make for steadiness afloat. Not only will she provide hospital accommodations for the sick of the fleet, but experience of a number of years with the *Solace* has shown the necessity of making provision for an out-patient department, wherein men of the fleet may receive special treatments and examinations, returning to their ships on the same day.

"The navy is also to be congratulated upon the consistently maintained standards that are giving us a personnel which is the pick of the ambitious youth of our nation. During the past year 106,392 sought enlistment in the navy. Of these, only 30.18% were accepted. During the last four years, owing to a full or relatively full complement, the large number of applicants, and consequent ability to make more careful selection, the percentage of acceptances has decreased from an average for the previous six years of 52.67 to 30.18. The present rigidity of physical requirements not only insures a fine standard of men, but helps to lighten the pension load of the country in future years. The urgent need of more men, as would happen in time of war, could be met by a modification of the standards without entailing the acceptance of any deficient types."

Finally, the report describes the advances that have been made in the medical education of candidates for the navy hospital corps. In 1914 two training schools for hospital corps men were established,—one at Newport, R. I., and one at San Francisco. Successful schools have also been established at Samoa and Guam for training native women as nurses.

"Homes for nurses at Mare Island and Boston have been furnished, and provision has been made on the coast lines south of Norfolk and Mare Island, which are as yet unprovided with navy hospitals, for the calling into being of mobile Red Cross hospitals of 250 beds each, with complete personnel and equipment. To prepare the Medical Reserve Corps, a correspondence school has been initiated for the purpose of training these officers. The higher standards, the zeal and sacrifices of the men in this corps, and their devotion to health and sanitation, cannot be too highly commended.

"Authority has been given by Congress for ample reserve stock, medical and surgical supplies, which is recognized as essential in a comprehensive plan of being ready for emergencies."



### MASSACHUSETTS CONFERENCE ON FEEBLE-MINDEDNESS.

IN last week's issue of the JOURNAL we noted the annual conference of the Massachusetts Society for Mental Hygiene, which is being held during the present week at Ford Hall, Boston. The entire conference this year is devoted to the subject of feeble-mindedness, and an admirable program, of which a portion was published last week, has been arranged. At the initial meeting, on the evening of December 13, Dr. Walter E. Fernald, superintendent of the Massachusetts School for the Feeble-minded, at Waverley, discussed the present practicabilities in the way of protection, education, supervision and segregation of the feeble-minded, pointing out our present lack of adequate facilities for this purpose.

"Many feeble-minded persons eventually become permanent public charges. Many run the gamut of the police, the courts, the penal institutions, the almshouses, the tramp shelters, the lying-in hospitals, and often many private societies and agencies, perhaps, eventually, to turn up in the institutions for the feeble-minded. At any given time, it is a matter of chance as to what state or local or private organization or institution is being perplexed by the problem they present. They are shifted from one organization or institution to another as soon as possible. At present there is no bureau or officer with the knowledge and the authority to advise and compel proper care and protection for this numerous and dangerous class."

The afternoon meeting of Thursday, December 14, will be devoted to a discussion of the problems associated with feeble-mindedness and illegitimacy, and the evening session of that day to a symposium on types of delinquent careers, and feeble-mindedness regarded from its legal aspects and in reformatories. On Friday afternoon, December 15, will be discussed methods of caring for the different groups of feeble-minded subjects, and on Friday evening there will be a final meeting with papers, among which will be one by Dr. Robert M. Yerkes on the diagnosis of children needing special care, and one by Prof. William H. Burnham of Clark University on pseudo-feeble-mindedness.

The problems of feeble-mindedness, like many others of those with which the present generation has particularly undertaken to deal, are as yet far from complete or satisfactory solution. It is only by coöperative interest in conferences such as the present that ultimate progress may be expected.

### PETER BENT BRIGHAM HOSPITAL.

THE recently published second annual report of the Peter Bent Brigham Hospital covers the activities of that institution for the year ended Dec. 31, 1915. During this time there have been admitted into the wards of the hospital 3417 patients and there have been 8536 new patients treated in the out-door department. The x-ray department made 4572 examinations and there have been over 2229 examinations made in the serologic laboratory and 750 studies in the respiration laboratory. The total operating expenses for the year have been \$269,913.46 and the receipts from patients have amounted to \$88,651.55.

In the report issued by the Hospital of its first year's work, attention was drawn to the utter lack of uniformity in the statistical tables of surgical cases and operations as they are presented by the various hospitals of the country which make any pretense at all of tabulating the results of their surgical work. Unquestionably their value would be increased if the hospitals of a given community would agree upon a uniform system of tabulation. To this end the report of the surgical department contains the following statement of progress toward this result. "A committee on hospital organization had already been established by the Massachusetts Medical Society, and in conjunction with representatives of the major hospitals a meeting of this committee was held at which an agreement was reached and a sub-committee appointed. This sub-committee has held several meetings, and it is hoped that eventually some uniformity in nomenclature as well as in the system of tabulations may be agreed upon. The so-called 'International Classification,' though compiled merely for the purpose of registration of mortality statistics, has been utilized by many institutions, chiefly with the Bellevue modifications and rearrangements, as a means of recording morbidity statistics as well. Unsatisfactory as this classification is for clinical purposes, it has nevertheless seemed best to continue to build upon this foundation until some more acceptable method is devised, in the hope that more hospitals will near(ly) become accustomed to the use of the title numbers."



## MEDICAL NOTES.

**NEW YORK DIAGNOSTIC SOCIETY.**—Report from New York on November 30 announces the organization in that city, of the New York Diagnostic Society, consisting of about three hundred physicians and surgeons, with the following officers: Dr. M. Joseph Mandelbaum, president; Dr. Dewitt Stetton, first vice-president; Dr. Otto Hensel, second vice-president; Dr. Julius Auerbach, treasurer; Dr. Monroe Kunstler, secretary. This Society has already raised a fund of \$100,000 and when this sum is doubled it purposes to build, establish and maintain a diagnostic hospital, with a staff of experts by whom diagnoses will be made and patients referred either to a specialist or to the general practitioner by whom they were first sent to the Hospital.

**PREVALENCE OF DISEASE IN THE UNITED STATES.**—The weekly report of the United States Public Health Service for November 24, 1916, states that during the month of October there were eleven cases of cerebro-spinal meningitis in Massachusetts, forty-one of malaria in New Jersey, and three hundred and sixty-seven of typhoid fever in Maryland.

**CHOLERA IN TURKEY.**—It is reported that Asiatic cholera became epidemic in Turkey in June, 1916. From that time until the middle of September there were 9009 cases of the disease with 4651 deaths.

## EUROPEAN WAR NOTES.

**REPORT OF BELGIAN RELIEF FUND.**—The recently published third annual report of the New England Belgian Relief Fund contains the following statement by Mr. John S. Codman, manager of the local relief fund.

"Our fund was organized in October, 1914. The Belgians were the first war sufferers, and, as they had at the beginning the undivided sympathy of the New England public, the contributions came in very rapidly during the first three months of the fund's existence. Later, as was to be expected, after the first burst of enthusiasm and when the needs of other peoples began to claim attention, the contributions fell off despite the ever-increasing need.

"During the early months of the war there were also large contributions of food.

"In January, 1915, the cash receipts were swelled by a sale of a large consignment of potatoes contributed from Maine and sold for cash, and in February \$16,000 was received as the proceeds of the Belgian Kermesse. During the spring and summer of 1915 receipts were very small, but on Nov. 17, 1915, a second general appeal was sent out for funds to purchase clothing for the coming winter, and the receipts

for November jumped from \$2300 at the close of business on Nov. 17 to \$31,300 at the end of the month. In 1916, the spring again showed a falling off, but in the summer, as the result of persistent advertising, the receipts, compared with corresponding months of the previous year, were greatly increased with little additional expense. These receipts are not really attributable to those months, but should be spread over a number of months.

"In the autumn of 1915, a great effort was made to meet the urgent call for clothing needed for the winter in the conquered part of Belgium, and \$60,000 was spent for this purpose in the three months of October, November and December.

"The total purchases (mostly clothing) for the year Oct. 1, 1915, to Sept. 30, 1916, amounted to \$121,411.34.

"In addition to the above spent for relief in the conquered part of Belgium, \$10,000 was forwarded to the Rockefeller Foundation to help the work of removing children from the war zone in Flanders to Switzerland, there to be cared for and educated.

"The sales force has been utilized for much clerical work in connection with letter appeals for funds, and these appeals have brought in at headquarters over \$7000 cash contributions at a very small percentage of expense. Still other cash contributions, amounting to nearly \$9000, have been received at headquarters.

"The books of the fund have been audited by Harvey S. Chase & Co., covering all transactions up to May 1, 1916, and their report shows total contributions and interest on same \$366,211.72, total spent for relief \$332,433.87, and \$11,834.13 cash on hand, indicating a total administrative expense of \$21,943.72, or only six cents out of every dollar contributed.

"Through the kindness of Montgomery and Stone and other well-known theatrical stars, a very enjoyable performance was given for the benefit of our fund in the Colonial Theatre on Jan. 28, 1916.

"On April 26, 1916, a band concert was given for our fund in Symphony Hall by the Cercle Musical Instrumental of the Union Belge, Inc., Modeste Alloo conducting. The band was assisted by Mlle. Renée Longy, Mr. Georges Longy, Mr. De Maitly and Mr. Orphée Langevin.

"Our fund coöperated with other local relief organizations in the Massachusetts booth of the Allied Bazaar in New York last June. From this the net proceeds to our local Belgian fund amounted to approximately \$500, but as one-third of the net proceeds of the Allied Bazaar itself went to the Commission for Relief in Belgium, our efforts in behalf of Belgium are represented by a sum considerably larger."

An earnest appeal for continued support is made to the public by the executive committee of the Belgian Relief Fund.



**RED CROSS RELIEF IN SERBIA.**—Report from Washington on November 29, states that the Austro-Hungarian government has requested the American Red Cross to discontinue on December 1 its relief work in Belgrade and northern Serbia. As a matter of fact, this work had practically come to a standstill since the beginning of the Roumanian invasion, for the supplies distributed by the Red Cross in northern Serbia were largely procured from Roumania.

"Nearly \$75,000 has been contributed to that section from this country, while 100 carloads of supplies from Roumanian relief committees and eighty from Swiss committees have been distributed by the American agents. Edward Stuart, assisted by Charles Fox, has cared for about 36,000 people in Belgrade and Dr. Edward Ryan has endeavored to reach about 100,000 in the interior.

"American relief in southern Serbia now is thrown into greater importance by Austria's request and especially by the advance of the Allied armies about Monastir. Reports from that city say 200,000 people are in distress, as the retreating armies of the Central Powers are said to have stripped the city bare of food and supplies. Shipments are being prepared for that section."

**AMERICAN RED CROSS WAR RELIEF.**—In a recent letter from Miss Ethel W. Putney, Secretary of the American Red Cross Committee at Cairo, Egypt, which has, for some time past, been supplying food and clothing and affording medical attention to some 4,000 or more Armenian refugees living in a "tent city" on the outskirts of Port Said, Egypt, a request is made for \$16,000 for the continuance of this work during the next year. The Red Cross and the American Committee for Armenian and Syrian Relief have joined in providing the amount requested.

"Individual gifts," says Miss Putney, "have practically ceased. Therefore we come to you for the whole sum of our next year's budget. We shall greatly appreciate if you will cable us your decision at your earliest opportunity. You will readily see that our plans for the winter which is shortly upon us depend upon your granting this budget."

Among the refugees are 700 cases of pellagra, and in order to meet the special diet requirements of these patients, a considerable increase of expense is necessary. The Committee has established a system of hot baths in the camp, which is giving great satisfaction and is of material assistance in maintaining the health of the refugees.

The camp is largely self-sustaining through a system of industries which permits a great many of the inmates to be kept steadily employed on productive labor. For instance, about 200 women are making crochet work, while a great

many of the refugees are employed at manufacturing army shirts, of which about 1,000 are turned out every week. These are sold to the British Army at good prices.

Through its agents in Saloniki, the American Red Cross is preparing to undertake the relief of a large number of distressed civilians in southern Serbia, particularly in and about Monastir, just as soon as it is possible to enter that section behind the lines of the Serbian Army. The Red Cross agents have cabled an estimate that 200,000 civilians occupy the section of country just wrested from the Bulgarian forces by the Allied troops, and that a very large percentage of this population is in need of assistance. Because of rough roads and the lack of railway facilities the agents suggest that food supplies be sent in small cases which may be carried on pack trains. The Red Cross is also requested to send three two-ton trucks for the transportation of supplies.

A first shipment of food supplies, purchased at a cost of \$5,000, will leave New York within a day or two, and \$5,000 additional have been cabled to the agents at Saloniki for emergency purchases. As the situation develops, large additional shipments of supplies will follow and it is probable that the Red Cross staff in Saloniki will be increased.

**WAR RELIEF FUNDS.**—On Dec. 9 the totals of the principal New England relief funds for the European War reached the following amounts:

Belgian Fund .....	\$192,934.54
French Wounded Fund .....	163,516.81
Armenian Fund .....	128,721.98
French Orphanage Fund .....	71,241.31
British Imperial Fund .....	70,322.31
Polish Fund .....	52,371.26
Permanent Blind Fund .....	39,835.94
Italian Fund .....	28,233.04
LaFayette Fund .....	21,079.03
Wittenberg Prisoners' Fund ..	2,013.65

#### BOSTON AND NEW ENGLAND.

**WEEK'S DEATH RATE IN BOSTON.**—During the week ending Saturday noon, the number of deaths reported was 209, against 219 for the same period last year, with a rate of 14.33, against 17.35 last year. There were 28 deaths under one year of age, against 41 last year, and 64 deaths over 60 years of age, against 90 last year.

The number of cases of principal reportable diseases were: diphtheria, 36; scarlet fever, 20; measles, 8; whooping cough, 4; typhoid fever, 9; tuberculosis, 46.

Included in the above were 10 cases of cases of non-residents; diphtheria, 6; scarlet fever, 4; tuberculosis, 7; smallpox, 1.

Total deaths from these diseases were: diphtheria, 1; typhoid fever, 2; tuberculosis, 2.

Included in the above were the following deaths of non-residents: tuberculosis, 2.



HOSPITAL BEQUEST.—The will of the late Joseph Faulkner of Hamilton, Mass., which was recently filed for probate at Salem, Mass., contains a bequest of \$5000 to the Lynn Hospital, to be known as the Faulkner Fund, the income to be used for the general purposes of the Hospital.

### Massachusetts Medical Society.

#### WORKMEN'S SICKNESS INSURANCE AND THE DOCTOR.

WORKMEN'S SICKNESS INSURANCE, whether in the form of the Dotten bill or in other guise, is largely a medical question. If a bill providing for it should be passed without more care than was evidenced in the passage of the present Accident Compensation Law in this State, it seems probable not only that medical care of the injured workman would be poor, but that the whole practice of medicine in the Commonwealth would be disrupted; for the law seems likely to include in its provisions, families as well as actual wage-earners within a \$1200 limit.

Our profession has a record for altruism, but to ask us to sacrifice ourselves to a plan which we are not sure of as a benefit even to our patients would be absurd!

The undersigned—a committee appointed by the Council of the Massachusetts Medical Society, in June, 1916, to look after the interests of the profession in this matter—have given a good deal of study to the question, and have tried to profit by the work previously done by others. Also, we have kept in touch with the Recess Committee of the Legislature, designated to consider this among other questions for report to the coming legislative session.

It has seemed to us timely to present to the profession a draft of provisions that represent what we may call the irreducible minimum of medical rights. In the drafts for bills, and in the bills introduced for such legislation to date, the medical side has been strangely neglected.

We understand that the proponents of the Dotten Bill have now in preparation changes and amendments to meet this neglect. Nevertheless, though hoping that others may protect our interests or rights, we feel it the duty of medical men to protect themselves.

The draft herewith submitted is put before the medical profession of the State for consideration and discussion. It should not be given out as representing the opinion of the profession until we have more expression of opinion.

There seems to be some divergence of view in the profession as to the value of the main principle involved. This is natural. Your committee may well be wrong in this, but we have felt that it was not within our province to pass on this very large question; we have felt

that it was for us only to detail the conditions necessary, in case such a bill should pass the Legislature, in order that the workingman should be cared for, and cared for properly, without utterly ruining the doctor.

We believe, by the way, that ruining the doctor would often kill or spoil the workingman.

The draft herewith presented seems to us to represent the minimum demands we must make if the proposed legislation is to go through. More unfavorable conditions must result in inferior medical service, and so work to the defeat of the intent of such legislation.

The working man will necessarily hesitate in his adherence to a scheme that does not take proper care of him. The doctor is far within the edge of his rights, if he wants to know where he comes in.

**SECTION 1. Medical, Surgical and Nursing Attendance.** All necessary medical, surgical and nursing attendance and treatment shall be furnished by the carrier from the first day of sickness, during the continuance of sickness, but not to exceed twenty-six (26) weeks of disability in any consecutive twelve (12) months. In case the carrier is unable to furnish the benefit provided for in this section, it must pay the cost of such services actually rendered by competent persons at a rate approved by the Commission. Competent physicians and surgeons shall mean those upon the panel, as provided for in Section 2. By the rate approved by the Commission shall be meant the rate established in Section 4. By furnished (lines 3 and 6) shall be meant furnished as provided in Section 2.

**SECTION 2. Medical and Surgical Service.** On or before . . . . . every physician and surgeon who, being legally qualified to practise in Massachusetts, shall desire to serve under this act, shall register for this purpose with the Commission, and each carrier shall be, within a reasonable time after such date, furnished by the Commission with a list of physicians and surgeons so registered. From this panel, so constituted, the carriers may indicate to their insured a preference, but the patients shall have free choice among the physicians or surgeons upon this panel, subject to the physician's or surgeon's right to refuse service on grounds specified in regulations made under this act by the Commission, provided, however, that no physician or surgeon on the panel shall have on his list of insured patients more than 500 insured families or more than 2000 insured individuals. The Commission shall, upon presentation of satisfactory evidence that any physician or surgeon upon the panel is incompetent, neglectful of his duty, or dishonest, suspend or remove such physician or surgeon from the panel, and decision of the Commission shall be final.

**SECTION 3. Appointment of Physicians and**



*Surgeons as Referees.* The Commission shall establish Districts and shall appoint a physician or surgeon as referee in each District; such referee shall be paid by the Commission a salary not to be less than \$ per annum and shall devote his entire time to the work. It shall be the duty of such referee to supervise the character of the medical and surgical service in the interest of the insured patient, the physician, the carrier and the Commission. He shall decide all disputes involving medical or surgical questions that arise between insured patients and physicians, between physicians serving upon the panel, between insured patients and carriers, or carriers and physicians, including the termination of disability. His decision may be appealed from to the medical advisory board, whose recommendation shall be given to the Commission, whose findings shall be final.

*SECTION 4. Payment of Physicians and Surgeons.* Physicians and surgeons, serving upon the panel, shall be paid by the carriers for medical or surgical services rendered to the insured a fee per visit that shall be not less than the average minimum fee for services rendered by physicians and surgeons of the locality in similar cases. Services rendered in maternity cases shall include previous supervision, when applied for, for at least six (6) weeks previous to the delivery, and supervision for four (4) weeks after birth, included as a part of the care of childbirth.

In case of dispute between physicians and carriers as to charges for services, the Commission shall have the power to decide, and their decision shall be final.

*SECTION 5. Medical and Surgical Supplies.* Insured persons shall be supplied by the carrier with all necessary medicines, surgical supplies, dressings, eye glasses, trusses, crutches and similar appliances prescribed by the physician, not to exceed in cost for any one insured person the amount of \$ in any one year.

*SECTION 6. Hospital Treatment.* Hospital or sanatorium treatment and maintenance shall be furnished upon the approval of the medical officer of the carrier instead of all other benefits, except as provided for in Section , with the consent of the insured member or that of his family, when it is not practicable to obtain his consent. The carrier may demand that such treatment and maintenance be accepted when required by the contagious nature of the disease, or when in the opinion of its medical referee, such hospital treatment is imperative for the proper treatment of the disease or for the proper control of the patient. Cash benefit may be discontinued during refusal to submit to hospital treatment. Hospital treatment shall be furnished for the same period as cash benefit. This benefit may be provided in those hospitals and sanatoria with which the carriers have made

satisfactory financial arrangements, provided that such hospitals are of a standard approved by the medical advisory committee. A charge of \$15.00 per week shall be considered a proper charge per patient for hospitals and sanatoria.

*SECTION 7. Maternity Benefits.* Maternity benefits shall consist of all necessary medical, surgical and obstetric aid, materials and appliances which shall be given insured women and wives of insured men. A weekly maternity benefit payable to insured women equal to the regular sick benefit of the insured for a period of ten (10) weeks, of which at least six (6) shall be before delivery, shall be made on condition that the beneficiary abstain from gainful employment during the period of payment.

*SECTION 8.* From a list of twenty (20) physicians or surgeons recommended by the Massachusetts Medical Society and the Massachusetts Homeopathic Medical Society, each in proportion to its total membership, the Governor shall appoint a Medical Advisory Committee of five members to serve respectively five, four, three, two years and one year. Vacancies on this board from death or resignation shall be filled for the unexpired term. Each succeeding appointment, except for the filling of such vacancies, shall be for five years. The members of this Committee shall be paid only for actual expenses incurred in the performance of their duties. It shall be the duty of this Committee: (1) to advise the Commission on medical matters; (2) to standardize contracts with hospitals and dispensaries; (3) to hear and act on all disputes arising, including such as are referred to them on appeal as provided in Section 3. Their findings shall be transmitted to the Commission for approval and adoption.

It is recommended that, owing to the medical questions involved in the proposed act, the act be so drawn that there shall be medical representation upon the Commission.

F. J. COTTON,  
W. H. MERRILL,  
F. W. ANTHONY.

## Miscellany.

### SOCIETY NOTICES.

**THE BOSTON CITY HOSPITAL.** The Boston City Hospital Medical Meeting, to be held in the Surgical Amphitheatre, Thursday, Dec. 14, at 8.15 o'clock, p.m., will discuss "The Laboratory and Clinical Aspects of Acute and Chronic Nephritis." Pathology, Dr. F. R. Mallory; "Clinical Aspects," Dr. Henry Jackson; "Renal Efficiency," Dr. J. P. O'Hare. Physicians and medical students are invited to attend. Hospital telephone, R.R. 7100.

**THE NORFOLK DISTRICT MEDICAL SOCIETY.** A regular meeting of the Society will be held in the Surgical Amphitheatre, Boston City Hospital, Tuesday evening, Dec. 19, at 8 o'clock sharp. Telephone R.R. 7100. Business.



Communication: A Symposium on Infantile Paralysis. "Pathology," F. B. Mallory, M.D.; "Clinical Aspects," E. H. Place, M.D.; "After-treatment," J. J. Thomas, M.D. Dr. Place will give a ward visit from 4.30 to 5.30 p.m.

BRADFORD KENT, M.D., *Secretary*.

NEW ENGLAND PEDIATRIC SOCIETY.—The forty-fifth meeting of the New England Pediatric Society will be held in the Boston Medical Library, Friday, Dec. 20, at 8.15 p.m.

I. Report of Council and nomination of officers.

II. The following papers will be read:

1. Case report, Wyman Whittemore, M.D., Boston;
2. "Some Observations with Sour Milk Feeding," C. K. Johnson, M.D., Burlington, Vt.;
3. "Difficulties in the Diagnosis of Diseases of the Hip-Joint," A. T. Legg, M.D., Boston;
4. "Should All Milk be Pasteurized?" Richard S. Eustis, M.D., Boston.

III. Election of officers.

Light refreshments will be served after the meeting.

A. C. EASTMAN, M.D., *President*.

RICHARD M. SMITH, M.D., *Secretary*.

HARVEY SOCIETY.—The fourth lecture in the current series before the Harvey Society will be delivered at the New York Academy of Medicine on Saturday evening, December 16, by Prof. Henry H. Donaldson of the Wistar Institute of Anatomy and Biology, on "Growth Changes in the Mammalian Nervous System."

#### MASSACHUSETTS MEDICAL SOCIETY.

##### SPECIAL MEETING OF THE COUNCIL.

There will be a special meeting of the Council in Sprague Hall, Boston Medical Library, Wednesday, Dec. 20, 1916, at 11 o'clock, A.M., to consider the proposed legislation by the Massachusetts General Court on Industrial Health Insurance. The attention of Councilors is directed to the "Dofen Bill," the full text of which may be found in the BOSTON MEDICAL AND SURGICAL JOURNAL of Dec. 7, 1916, under "Miscellaneous." A special number of the JOURNAL, devoted to Social Insurance, will be issued on Tuesday, Dec. 19, instead of on Thursday, Dec. 21, the regular date of issue.

WALTER L. BURRAGE, M.D., *Secretary*.

Boston, Dec. 13, 1916.

#### HARVARD UNIVERSITY MEDICAL SCHOOL.

##### HARVARD MEDICAL MEETINGS.

First Meeting Friday Evening, Dec. 15, 8 p.m.  
A Amphitheatre.

A series of meetings is being arranged by the Harvard Medical School at which each department will, in turn, give an account of the departmental activities, both in research and in teaching. In this way it is hoped that members of the teaching staff, graduates and friends of the School may be kept fully informed of what is going on.

The first meeting will be held on Friday evening, Dec. 15, at 8 p.m., in the amphitheatre in Building A. The Department of Pathology will have charge of the meeting. The following addresses will be made:

Dr. Wolbach: "General Survey of the Department of Pathology and Methods of Teaching;" "Studies in Rocky Mountain Spotted Fever."

Dr. Wright: "Recent Work on Blood Forming Organs—Normal and Pathological."

Dr. Mallory: "The Value of Hospital Laboratories to Teaching and Research with Examples Illustrated by Lantern Slides."

Light refreshments will be served in the Faculty Room after the meeting.

EDWARD H. BRADFORD, M.D., *Dean*.

#### APPOINTMENTS.

UNIVERSITY OF ALABAMA.—Dr. Joseph M. Thüringer has been appointed professor of anatomy, and Dr. Claude W. Mitchell, professor of physiology and pharmacology in the University of Alabama Medical School.

UNIVERSITY OF ILLINOIS.—Dr. L. V. Heilbrum has been appointed instructor in microscopic anatomy at the University of Illinois Medical School.

#### RECENT DEATHS.

DR. GEORGE DOUGLASS RAMSAY, who died at Newport, R. I., on November 27, was born in New York City in 1869. He was a surgeon major in the United States Volunteer Army during the Spanish American War and a member of the United States Medical Reserve Corps.

DR. FRANCIS JOSEPH KEANY died at his home in Boston, November 23. The son of Matthew Keany, a prominent North End politician and property owner, he was born in Boston, March 1, 1866, was educated in the public schools and in Boston College, from which he was graduated in 1889. After graduating from the Harvard Medical School in 1892, he spent a year at the Rotunda Hospital in Dublin, and three years in Vienna, studying dermatology. He was dermatologist to the Carney Hospital and to the Boston City Hospital, and consulting dermatologist to St. Elizabeth's Hospital, and had served as a trustee of the City Hospital since 1897. He held the position of professor of dermatology to Tufts College Medical School. He held membership in the Massachusetts Medical Society, the Boston Athletic Association, and the Clover Club. His widow and three children survive him.

DR. J. PICOT, who died in France on September 26, 1916, was born in the department of Meurthe-et-Moselle in 1839. He obtained his medical degree from the University of Strassbourg and in 1872 was appointed deputy professor of medicine at Tours. In 1877 he was awarded the Montyon prize by the Institute of France for his work on clinical pathology. In 1878 he was appointed professor of pathology at the University of Bordeaux, and in 1879 professor of clinical medicine. He was elected a corresponding member of the French Institute in 1891, and in 1899 received the cross of the Legion of Honor. He was one of the founders of the Gazette Hebdomadaire des Sciences Médicales de Bordeaux.

DR. HARRY PRINGLE ROBINSON, a Fellow of the Massachusetts Medical Society, died at his home in Amesbury, Nov. 28, following an operation for appendicitis. He was a graduate of Harvard Medical School in the class of 1902, and was 40 years old. He is survived by his widow.

DR. WALTER S. SUTTON, who died in Kansas City on November 10, was professor of surgery at the University of Kansas. He was best known to biologists for his discovery of the mechanism of Mendelian inheritance in germ cells.

DR. JOHN EDWIN WALKER, who died on November 22, at Thomaston, Maine, was born in Union, Me., on Feb. 23, 1828. He received the degree of A.B. in 1881 and that of M.D. in 1884 from Bowdoin University. He had practised his profession in Thomaston since 1881, and for over twenty-five years had been physician to the Maine State Prison in that city. He was a member of the American Academy of Medicine, the American Medical Association, the Maine Medical Association, the Maine Academy of Medicine and Science, and the Knox County Medical Society.



# The Boston Medical and Surgical Journal

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### Address.

## THE WORKINGMEN'S COMPENSATION ACT.

By JOHN C. CROSBY, PITTSFIELD, MASS.,  
*Justice, Massachusetts Supreme Court.*

THE Workingmen's Compensation Act deals with a comparatively recent piece of legislation about which the people, independently of members of the legal profession, have a very limited knowledge. Its importance and scope is so far-reaching as to make a general knowledge of its purpose and practical operation desirable, if not necessary, to every citizen. The importance attached to legislation affecting liability, whether civil or criminal, of employers toward their workmen for injuries sustained by the latter in the course of their employment, marks an epoch in our history. Slowly, the workman, the man who earns his livelihood by his arms and his legs, on a weekly or daily wage, has forced himself to the front and demanded of the two sources of the law, the legislator and the judge, that in consideration of his employment, and the facts of the case as they press upon the owner of the arms and legs, shall have due prominence given them.

Compensation laws look at a worker as an economic machine, a mere earner of wages; they view his nerves, his eyes, his hands and feet simply as a means of producing something of value. If his occupation takes his life, the loss

of his dependents is to be measured by a part of the wages which it is assumed he would, if alive, have earned and used for their benefit. Maiming, disfigurement and loss of the enjoyments of life are not under the theory of the law elements of damage. The evidence is plenary that the old code is illogical and unjust, a breeder of wasteful litigation and pauperism; of unnecessary antagonism between employer and workmen, of low and unprofessional ideals in the legal and medical professions.

It is a matter of common knowledge that modern industrialism is characterized by a frightful destruction of life, limb and health; nobody knows how many fatal and serious accidents there are in the industries of the United States, although there is an immense statistical literature on that subject, and in the course of another decade we shall probably have something approximating accurate figures; but we do know that the fatal accidents run into the tens of thousands, and the serious accidents probably into the hundreds of thousands. The gist of the new theory is that the industries that take this toll of life and limb ought to pay to the victims and their dependents some part of the lost earning power thus destroyed; that every industry should charge that cost as a part of its expense of production. Industries must and do bear the risk of accidents and destruction as to their machinery, tools and animals; they ought to bear some part of similar economic losses now falling upon the human factors engaged in production.

Compensation acts treat the workman as a machine; the present law treats him worse than

\* Read before the Berkshire District Medical Society, Dec. 15, 1916.



machinery is treated. On both sides the idea of fault and negligence and being "to blame" is entirely eliminated, except that in our act, if the employee is injured by reason of his own serious and wilful misconduct, he gets nothing. Correlatively, the employer, guilty in a like manner, must pay into the insurance fund enough to double the compensation otherwise payable to the victim. It is a mere incident whether the claims of the victim are made directly against the employer, as under the English system, and under many of the other American acts, or whether the claim is made against the insurance association into which employers pay premiums, graded in accordance with the accident risk. In either event, the employer is dealt with simply as the medium of collecting from the consumer, and in distributing to victims some part of the loss in wages incident to the breakage of the human tools. The gist of the theory is that this special tax should be levied upon industries for the benefit of the victims of accidents in those industries.

There are those who are opposed to legislation such as is embodied in compensation acts; in the first place, upon the ground that the employer should not be obliged to contribute to employees who are injured without any fault of the employer, and because, even if constitutional and not in violation of the fourteenth amendment, in effect it involves taking the employer's property from him without due process of law. There is another class of people, who may be styled "individualists," who object to legislation of this character, in that it establishes a species of guardianship over the employee; that it limits individual freedom and responsibility, and is "contrary to the genius of American institutions."

The objection to this kind of legislation goes upon the theory of the independence of others, and of conditions created and controlled by others; that it takes away, as a practical matter, freedom of choice and self-reliance; it is said that every man should be allowed to work out his own salvation without dictation, interference or control, by the state, in matters which so nearly concern his personal welfare.

The theory of "individualism," as taught by these philosophers, is that "that government is best which governs least"; that individuals should be left to use the powers, and only the powers, which God has given them, subject only to the restraining hand of government to see that no individual encroaches upon the rights of another individual. On this theory, grants of special powers to one set of individuals are as objectionable as restraint of the natural powers of other classes; there can be no doubt that such legislation is in sharp contrast with the theory of the limitations of a government laid down by John Stuart Mill. However logical and sound this theory of "individualism" was in early times, changed conditions have made necessary

and justifiable a wide departure from old theories.

In this age of industrialism somebody must bear the burden of the industrial accidents which are found to be an inevitable incident of modern industry. Manifestly, it is just that that burden should be thrown upon the consumer in the price of the product; to put a liability upon the employer is only a means, and apparently a most direct and effective means, of making the price of the product include the cost of the waste of the human tools necessarily employed in that production. In the last analysis the Workmen's Compensation Acts are no more socialistic or destructive of individualism than many of our laws which have been in existence from the beginning. There is no justification for taxing the community to support the insane and paupers, the idle and vicious, the unfortunate of all classes, except that the general welfare of society demands it.

It seems to me that the law is upon a proper and logical industrial basis; it deals with the problem as an insurance problem and not as a fault problem; it recognizes that accidents, whether due to the employers' fault, employees' fault, the risks of the business, or a combination of causes known and unknown, are certain to happen, and that their happening is an event of social importance, not a mere individual misfortune; it deals with these risks of life just as the Germans and ourselves have dealt with education as a great social need.

The State recognizes that insurance is as much a necessity for social welfare as education is a necessity. The theory of individualism is that each person should take care of himself, and that society will profit out of his so caring for himself. This theory fails when applied to industrial accidents under modern conditions. The sound theory of individualism or collectivism, or whatever one chooses to call it, is that within certain proper limits the mass of the people should be compelled to take care of themselves, but where they are unable to do so under special conditions, and loss of human life, and maimed and crippled men, women and children result, I believe it to be the duty of the State in the interest of the welfare of its people to remedy, so far as possible, such conditions by appropriate legislation.

The great wave of industrialism which has spread over Europe and this country, demands today a solution of problems between man and man which require broader views and ideas than have heretofore prevailed among legislators and judges. The enormous use of machinery, more or less dangerous, has contributed largely to the changed conditions; it has produced, and is annually producing, a vast army who have been maimed by its use; it presents a woeful sight, and is a melancholy commentary on our methods of production. At the outset it is important briefly to consider the remedies which exist,



independently of compensation acts, under which workmen are entitled to recover for personal injuries. At common law, the master is liable in damages for personal injuries suffered by his servant, received in the course of his employment, caused by the negligence of the employer, the servant himself being in the exercise of due care. The basis of such liability is negligence in the breach of duty: it is the legal duty I owe my neighbor not to hurt him. The common law of England, which, generally speaking, is the common law of this country, as well as that of the various states of the Union, recognizes the liability of the master for injury to the servant caused by the negligence of the former, but this rule is hedged about with certain important exceptions; first, the servant is precluded from recovery if his negligence, however slight, contributed to his injury; second, a man assumes the known risks of his employment; and third, the master is not liable for an injury received by a workman which is occasioned by the negligence of a fellow servant.

The injustice which often arose from the application of these rules of the common law in actions brought thereunder has resulted in the last few years in legislation the effect of which has been to modify the harsh and rigorous rules of the common law; these modifications are contained in enactments known as employers' liability acts.

In England an act of this kind was passed in 1880, and was intended to remedy the injustice of which the working population had long complained. In Massachusetts a similar act, patterned after the English act, was enacted by the Legislature in 1887. The writer happened to be a member of the House of Representatives during that year. Nearly all the states of the Union have enacted similar legislation.

Without undertaking to point out in detail the provisions of our Employers' Liability Act it is sufficient to say that it modified the common law, and permitted the recovery of damages by a workman for personal injuries, in many instances where no remedy previously had existed. These rules of law were established many years ago and were in force before the days of rapidly-moving machinery, and before the advent of electricity and the locomotive, and the result was that great injustice was done to many injured workmen under modern conditions by reason of the fact that these rules of law were not applicable to the existing situation, the loss to the injured employee being, in a great majority of cases, just as serious and as great whether he was injured under circumstances that permitted of recovery or not; and it so happened that a large percentage of people killed and injured were without any remedy because of the fact of the intervening negligence of a fellow servant, the assumption of the risk, or contributory negligence on the part of the injured employee; besides, where the injured

employee sought a remedy in court, it was attended with long delay and expense, the outcome was doubtful and conjectural, and the employer was always exposed to the hazard of a tremendous verdict, which to him might mean bankruptcy. In case of trial it meant a disarrangement of the factory while the men were attending court, a long period of waiting, with no compensation; and in many cases practical experience has shown that men injured under circumstances almost similar received compensation in some cases and in others received nothing, so that the law was distrusted and at times subject to contempt and ridicule.

It followed, that under the common law and the Employers' Liability Act many injured people were without remedy; it also resulted in great inequality by which sometimes a man was entitled to recover, when another, equally seriously injured, under circumstances which to the lay mind would seem to be practically the same, was held to be without remedy. I have in mind an instance which happened not many years ago where three trainmen were injured, each suffering the loss of an arm. While the injury in each instance was the same, one of the three was given a verdict of \$5,000 by a jury, the second was awarded \$2000, and the third received nothing.

A knowledge of these cases by the public, and especially by the men themselves, could not have engendered as much respect for the justice and equality of the law, as might be the case under other circumstances. Notwithstanding the additional remedies provided under the Employers' Liability Acts, the general opinion long has been prevalent both in this country and Europe that the law in force in industrial employment was fundamentally wrong and unwise and in need of radical change. The workman injured in his employment must of necessity bear the burden of his injury; the pain and suffering are his, and no system of law can change or shift that burden. Still, if his injury be not one which he has wilfully brought upon himself, but which has arisen from the hazard of his work, it was felt that the workman should be so placed by the law that he should have the right to call for and receive such prompt and certain compensation as would keep him and those dependent upon him from destitution.

On the continent of Europe, the law as to employers' liability, as distinguished from any scheme for compulsory insurance of workmen against accident, is substantially the same as our own common law, that is to say, it is a branch of the law of negligence. In regard to some special trades and occupations, there has been in many countries of Europe special legislation affecting employers' responsibilities, but apart from these enactments, the law of Europe is, for the most part, in accordance with the principles of the French Civil Code, which for more than a hundred years still remains the law of France.



The first workmen's compensation act to be enacted was by the Imperial Parliament in Germany in 1885. This law is based upon the insurance plan; it is compulsory, and commonly called the German system of insurance against accidents. It consists of two sister measures,—the sickness insurance act and the accident insurance act. These two acts are now in force, and together form the German scheme of which so much has been said and written. Under the Sickness Insurance Act the employer is bound to insure his workmen and pay the whole of the premiums in the first instance, but he is permitted to deduct from the wages of his workmen two-thirds of the cost, the remaining one-third being borne by the employer himself. A great majority of the accidents which occur there are dealt with under this act. The Accident Insurance Act includes cases where there is not a recovery within a period of thirteen weeks, and imposes upon the employer the obligation of providing the whole of the funds necessary to take care of those cases. It is seen, therefore, that for the first thirteen weeks of an accident, the workman pays two-thirds and the employer one-third, and in cases requiring further assistance the employer pays all.

The chief characteristics of the German system are that it is compulsory, mutual insurance, and that compensation is provided in every case except where the injury is intentionally self-inflicted. There was a great deal of opposition to this act in Germany when it was first proposed; it was claimed to be unfair to workers and it was said it would put such tax on industry that if the act became a law, Germany would lose its industrial supremacy. The act has been in operation in Germany for thirty years, and has met with the approval of every sincere friend of the German empire; Germany has not lost its industrial supremacy, and the act is regarded there as a most beneficial piece of legislation in behalf of the great mass of the people, protecting them in one of the most important exigencies of life; besides it has proved to be a bond of harmony between labor and capital, and employer and employee.

The first workmen's compensation act in England was passed in 1897, and in 1906 the original act was repealed and a new act was enacted by Parliament broader in principle and more extensive in its scope.

This subject, several years ago, received the earnest attention of our federal government, and in 1908 President Roosevelt, in a well-known message declared it to be a national duty to pass laws which would bring relief to injured workmen, and indicated at the same time the duty of the legislatures of the several states. He said: "I also very urgently advise that a comprehensive act should be passed providing for compensation by the government to all employees injured in government service. Under present conditions an injured workman in the

employ of the government has no remedy, and the entire burden of the accident falls on the helpless man, his wife and his young children. This is an outrage. It is a matter of humiliation to the nation that there should not be on our statute books provision to meet and partly to atone for cruel misfortune when it comes to a man through no fault of his own when faithfully serving the public. In no other prominent industrial country in the world could such gross injustice occur, for almost all the civilized nations have enacted legislation embodying the complete recognition of the principle which places the entire trade risk for industrial accidents (excluding, of course, accidents due to wilful misconduct by the employee) on the industry as represented by the employer, which in this case is the government. In all these countries the principle applies to the government just as much as to the private employer. Under no circumstances should the injured employee or his surviving dependents be required to bring suit against the government, nor should there be the requirement, in order to insure recovery, that negligence in some form on the part of the government should be shown. Our proposition is not to confer the right of action upon the government's employee, but to secure him a suitable provision against injuries received in the course of his employment. The burden of the trade risk should be placed upon the government. Exactly as the workman is entitled to his wages, so he should be entitled to indemnity for injuries sustained in the natural course of his labor. . . . The same broad principle which should apply to the government should ultimately be made applicable to all private employers. Where the nation has the power it should enact laws to this effect. Where the states alone have the power, they should enact the laws."

In his annual message to the legislature of the state of New York on January 1, 1909, Governor Hughes said: "I believe that it would be salutary to go further in accordance with the principles which have been announced in some of the jurisdictions, and in the case of injuries sustained by adults by reason of conditions created or permitted in violation of the labor law, to preclude a defense upon the ground of the assumption of risk by the employee. . . . I also recommend that provision be made for special and extra inquiry into the questions relating to employers' liability and compensation for workmen's injuries; our present methods are wasteful and result in injustice. Numbers of negligence cases are prosecuted upon a basis which gives the attorneys a high percentage of recoveries; only a small percentage of the premiums paid for insurance against liability is devoted to the payment of losses; as a result the workmen do not receive proper compensation, and the employers pay large amounts that do not reach them."



Soon after the President's message, above referred to, was delivered, and on May 30, 1908, in a modified form, a workmen's compensation act was enacted by Congress. This act guaranteed to employees of the United States the right to receive from it compensation for injuries sustained in the course of their employment. Although this act is of limited application, and provides but a limited measure of relief, its benefits have been many and real; it applies only to injuries received by artisans and laborers employed in manufacturing establishments, arsenals or navy yards of the United States, or in river and harbor or fortification work, or in hazardous employment in the reclamation service and under the Isthmian Canal Commission, under the Bureau of Mines, and in the Forestry and Lighthouse Service.

While figures showing the results of this act from the time of its enactment to date are not available to the writer, still an examination of the results obtained during the first three years after its enactment will give some idea of the benefits derived under the compensation act. During the first three years it was in force, compensation was paid in 5564 cases of injury, in 165 of which the injury resulted in death, and on account of these fatal injuries \$113,000 was paid to surviving dependents; on account of non-fatal injuries \$800,000 was paid to the injured persons themselves, but these figures do not include claims arising from workmen employed on the Panama Canal.\*

The people of the Commonwealth of Massachusetts, recognizing the long-continued and increasing demand for the modification or abandonment of the common-law remedies as applicable to the relationship of employer and injured employees, and, as ever, keenly alive to all progressive and humanitarian legislation, as early as 1887 took the first step toward a better system of dealing with industrial accidents, when in that year the Massachusetts Employers' Liability Act, above referred to, was enacted. This, by the way, was the first law of its kind to be passed in the United States. The subject of still further and more advanced legislation had been under consideration by the General Court from year to year since 1887, and culminated in the appointment of a special commission of five members under a resolve enacted in 1910. This commission, composed of intelligent and able men, well qualified for the work, after long study and careful investigation, reported a draft of a bill which was in substance adopted by the Legislature in 1911, and is contained in Chapter 751 of the Acts of that year; it is the present Workmen's Compensation Act of Massachusetts, except so far as it has been perfected by subsequent amendments.

The act is a well-drawn piece of legislation, and reflects great credit on the men who framed

it. Still, difficulties have arisen in its interpretation which could not have been anticipated in advance, or, if anticipated, could not have been fully guarded against until the act was put in practical operation.

The passage of this act is a sincere attempt to remedy existing conditions, and to place personal injury cases growing out of the relation of employer and employee, upon something like a humane and scientific basis of settlement, the fundamental consideration being that, just as a machine breaks down, or a manufacturing plant goes to pieces, and the loss falls upon the industry and enters into the cost of production, so, when an employee is killed or injured, the loss should fall upon the industry and become a part of the cost of production. This is the theory upon which this and similar legislation is based. Conditions are such that the employer can always protect himself against losses of this nature by insuring his employees, while conditions are such that a great majority of the employees either cannot or will not protect themselves against such losses.

Injuries to workmen in the course of their employment may be due to negligence or to accident; where negligence is the cause, the fault may be that of the workman or of his employer, or of a fellow workman, or even of a stranger; where pure accident is the cause no one is at fault. In all cases, the suffering and the loss fall on the injured person and his dependents, except so far as the law permits the loss to be compensated. The old law, formulated at a time when industrial operations were limited and simple, and conducted in small establishments, where responsibility could easily be fixed, is wholly inapplicable to modern conditions; the altered situation growing out of the immense changes made in industrial conditions has brought a realization of the great injustice worked by the old rules of law. Irrespective of the question of negligence, whether it was that of the employee, the employer, the fellow servant or the stranger, and irrespective of the risks incident to the dangerous nature of the occupation, it was recognized as grossly unjust that the sufferer alone should be allowed to bear the entire consequences, and all the burdens, of an industrial accident or injury; it was seen that the employment itself, if not the cause of the injury, furnished at least the occasion or the condition without which it could not have occurred, and so it has in recent years become the settled conviction of thinking people that the financial loss occasioned by an injury received in the course of employment is a proper charge against the industry itself, and that where such injury is not plainly due to the fault or misconduct of the injured person, the employer or that means is provided whereby the burden in such cases is shifted to a certain extent from a single person and distributed among many persons.

The Workmen's Compensation Act in

\* At the last session of Congress the act was amended so that it should apply to the act were enacted.



Massachusetts went into effect on July 1, 1912, and has been in practical operation ever since that time. It is to be remembered that if a person is killed or injured by reason of an accident which arose out of, or in the course of, employment, that he or (in case of his death) those dependent upon him for support, are entitled to compensation without reference to the questions whether his own carelessness contributed to the injury, or whether he assumed the risk, or whether the injury was due to the negligence of a fellow servant. Under the act all these questions are swept away. While it would be impossible to discuss in detail all the provisions of the act, or the many difficult and interesting questions which have arisen under it, a brief outline of its provisions may be given.

The Massachusetts act is modelled in part on the German and in part on the English systems. It is more like the German plan, but it is unlike both in that, in form at least, it is elective and not compulsory. Our act, while it applies generally to farm laborers and domestic servants, still as to these two classes it leaves to the employer the old defenses of contributory negligence, assumption of risk and negligence of the fellow servant. It is also to be observed that the act does not apply to those occupying positions in the public service; accordingly, school teachers, policemen and firemen are not entitled to compensation for injuries thereunder, although employees of a municipality engaged in a gainful pursuit, like the development and sale of electricity or water for profit, are covered by the law.

It provides as follows: First, from the standpoint of the employer. The employer, in the first instance, has the right to decide whether he will or will not give his employees the benefit of the act. He can do nothing; that is to say, in the event he decides not to give his workers the benefit of the act, and a man in his employment is injured, the employee is no longer obliged to prove his own care; so, too, questions as to the negligence of a fellow servant, or the assumption of the risk, are both immaterial. The employee has only one thing to prove in order to be entitled to compensation, and that one thing is the negligence of the defendant, which may be direct or indirect, his own personal negligence or the negligence of his servant. In other words, if an employer does not insure his help, the employee injured in his employ can recover if he can establish, to the satisfaction of the court, that the employer was in any way guilty of negligence. The employer, on the other hand, if he desires to give his men the benefit of the act does so by taking out a policy of insurance in one of the various insurance companies authorized to do business in the State; the employer pays his premium, and he is relieved from all responsibility to respond in damages if a person in his employ is injured, the insurance company being substituted for the

employer and assuming all liability. There is no exception to this, and that is that where the employer insures his men, and is himself guilty of serious and wilful misconduct; if that be proved he must pay to the injured employee double compensation, one-half of which is paid by the insurance company and the other half by the employer. This, however, is only in a case where there is serious and wilful misconduct on his part or on the part of his superintendent.

Second, from the standpoint of the employee: As has already been stated, if the employer does not insure the employee, the employee can in this case recover damages in the courts by proof of negligence, and merely upon proof of negligence of the employer. If, however, the employer insures his employees, the employee has the right to reject the compensation given under the act, and then has all the rights which he had prior to the first day of July, 1912, under the common law as distinguished from the statutes of the Commonwealth. In other words, in the case of the employer insuring his employees, and the employees rejecting the benefits of the Workingmen's Compensation Act, an injured employee can recover compensation if he can establish his own care, and the negligence of the employer, and that there is no assumption of risk and no negligence of a fellow servant; under such circumstances he is entitled to recover such compensation as a jury may award him. But it is to be noticed that in this case such employees are exclusively under the common law, as distinguished from the statutes of the Commonwealth; they have all their common-law rights but no statutory rights, and compensation for death being a statutory right, and not a common-law right, if an employee has rejected the provisions of the Workingmen's Compensation Act, no recovery can be had by his dependents in case of his death. If, on the other hand, the employee is injured under the act, and accepts the provisions, he thereby, in case of injury, recovers practically two-thirds of his wages during disability; and if he loses a leg or an arm, an additional one-half of his wages for a period of a hundred weeks down to twelve weeks, according to the extent of the injury; but in all cases he recovers two-thirds of his wages during disability, not to exceed, however, \$4000, or covering a period exceeding five hundred weeks, the maximum weekly compensation being \$10 per week, and the minimum compensation being \$4 per week. The injured workman is also entitled during the first two weeks after his injury to hospital and medical services free of charge.

It is to be noted, however, that, aside from furnishing to the injured workmen medical and hospital services free of charge, the act allows nothing for the first two weeks after the injury. This period is sometimes called the "waiting period." By an amendment passed



by the last legislature, which takes effect January 1, 1917, this period is limited to ten days. The English act allows nothing for the first week, unless the injury lasts two weeks, which results in many injuries lasting two weeks, and in a good deal of petty malingering and unnecessary expense in investigating trifling injuries. These petty injuries in the aggregate are said to cost English industries a large sum.

Another feature of our act which should be referred to is that, although as a rule, the compensation awarded is given to the injured workman, or, in case of his death, to his dependents, in weekly payments, it is provided, "in unusual cases" a lump sum may be paid if agreed to by all parties in interest and approved by the Industrial Accident Board.

The result of the act has been practically to eliminate the bringing of actions, either at common law or under the Employers' Liability Act, for personal injuries by workmen against their employers. This has resulted in relieving the courts of a very large number of cases which heretofore have occupied their attention. At the same time it is doubtful if there has been any decrease in litigation, because of the fact that a large number of cases have arisen growing out of the Workmen's Compensation Act, and which involve the construction and interpretation of its provisions, the law being of so recent enactment that questions are constantly arising as to its meaning, and as to whether many cases which have arisen do or do not come within its provisions. Where the injury results in death, and compensation is awarded to those who were dependent upon the deceased workman, a trust fund is created, which is secure from unfortunate investments, and debts, and is unassignable, the beneficiary is entitled to weekly payments for a period not exceeding five hundred weeks. The benefits arising by means of this method of compensation are manifest. The act has eliminated all speculation which had previously existed in personal injury cases on the part of anybody; the compensation comes from the employer direct to the pockets and homes of the injured employees, without any diminution, or expense or delay, and every injured employee of the same earning capacity, and receiving the same amount of wages throughout the Commonwealth, suffering from the same disability, is entitled to exactly the same compensation.

In its practical workings the act has taken away much of the bitterness between labor and capital occasioned by personal injury cases in the courts, and has brought about harmony between the injured employee and his employer. The act provides in practical effect for industrial insurance paid for by the employer exclusively for the benefit of employees. Aside from the pecuniary relief which is afforded to the injured workman, one of the great benefits which have come from this legislation, is the improve-

ment which has been made in the adoption of safety devices and appliances in factories and other places where labor is employed; great improvements have been made in this direction, with the result that the number of accidents in industrial occupations is constantly decreasing. To my mind this is of as great, if not greater, importance than the mere payment of compensation for injuries, because the great object to be accomplished by the act is, not compensation, but prevention; and while it is well to compensate a man if he becomes seriously injured, it is infinitely better so to guard the machinery upon which he is employed, and the place where he is put to work, that he may go through life unharmed.

The act also provides for the establishment of an insurance company, known as the Massachusetts Employers' Insurance Association, in which employers of labor are entitled to take out insurance in conformity with the provisions of the act. Employers are not limited to this state insurance association for the procurement of policies, but under the act are authorized to take out insurance in any liability insurance company authorized to do business within this Commonwealth.

In 1909, before the act took effect, practically only 36% of the money paid by employers or Massachusetts to settle all claims for injuries was paid to the injured public and to injured employees; in other words, 64% was kept by the insurance companies for the payment of expenses, premiums, and for profit.

The act provides for the establishment of an Industrial Accident Board, consisting of five members. This board administers the law without the necessity of the intervention of anybody to represent parties who come before it; the proceedings are informal, without technical pleadings or rules of practice, and the law is administered in a plain, simple, matter-of-fact way, in order that justice may be done. Before the compensation act was adopted, it met with the opposition of many employers of labor, who opposed it upon the ground that it would result in an undue and excessive burden upon them, because of the large premiums which they would be required to pay for insurance. The act has been in force for three years and a half, and in practice it has been shown that the expense for premiums has not been greatly in excess of the cost before the act took effect, and in some cases the amounts so paid have been less under the act than before its adoption.

During the year before the Workmen's Compensation Act became effective there was paid in premiums on liability insurance \$2,779,100. During the year ending June 30, 1911, the payrolls, which represent the earnings of injured employees, amounted to \$150,000,000, and the premium cost, based upon the payroll of about 1%, amounted to \$1,500,000. The cost is intended to be shifted to the consumer. Such



cost of insurance if placed upon the consumer, according to the returns for the year 1913, would amount to 18 cents upon a hundred-dollar purchase. This includes both the cost of losses and the cost of insurance administration.

It is doubtless true that in rare instances compensation is granted to unworthy persons. A case is given under the German act of a man who hoodwinked the insurance authorities in Berlin for the payment of 50% of his average weekly wages for a disability arising out of industry, and who was accidentally discovered to be following the occupation of an acrobat in Alsace. Another case is quoted where a man drawing a disability payment for an injured elbow was at the same time, under another name, earning a living as a pugilist.

The purpose of our act and its practical operation is well stated in Gould's case, reported in 215 Mass. 480, which is one of the first cases to be considered on appeal to our Supreme Judicial Court. It was said at page 482: "One main purpose of the act is to establish between employer and employee, in place of the common-law or statutory remedy for personal injury, which is based upon tort, a system whereby compensation for all personal injuries or death of the employee received in the course of and arising out of his employment, whether through unavoidable accident, negligence or otherwise (except through his serious and wilful misconduct), shall be determined forthwith by a public board and paid by the insurer. For the accomplishment of these ends, a simple method is furnished, operating without delay or unnecessary formality. . . the compensation is to be paid, not directly by the employer, but by the insurer, who is either the 'Massachusetts Employees' Insurance Association,' created by part 4 of the act, or any liability insurance company authorized to do business within the Commonwealth. The employee has no immediate relation with the insurer; he is the beneficiary under a contract between the employer and the insurer."

The Commonwealth was fortunate in the selection, as the first chairman of the Industrial Accident Board, of Hon. James B. Carroll of Springfield, now a justice of the Supreme Judicial Court. Judge Carroll brought to the Board a wide knowledge of the relations which exist between employer and workmen; he formulated the practice of the Board, and was largely instrumental in placing a humane and just interpretation upon the provisions of the act; his decisions under it have been very generally sustained by our highest court, when appeals thereto have been taken. His painstaking and intelligent work as the chairman of the Board has largely contributed to the success which has been attained in its practical operation.

This Board administers the law which affects the rights of about 900,000 workmen and

women, 27,000 employers of labor, and 27 large insurance corporations; also capital amounting to billions of dollars, products valued at billions more, wages above the one-half billion mark; and the rights of nearly all the working people of our Commonwealth and their families are involved in the administration of the Workingmen's Compensation Act, which I believe to be one of the most beneficent pieces of social welfare legislation heretofore enacted.

It is estimated by the Board that less than 150,000 employees are not protected by the act, but may bring action under the general law, with the three defenses of contributory negligence, negligence of a fellow servant, and assumption of the risk eliminated.

The payments under the act during the last full year that the act has been in force are as follows:

To employees receiving non-fatal injuries	\$1,502,185.43
To fatally injured employees and dependents	748,493.57
To physicians and surgeons for services	587,769.99
Total	\$2,838,448.99

When we realize that industry in Massachusetts takes a toll of the lives of five hundred employees during the course of each year, and leaves behind two thousand widows, orphans, fathers, mothers, sisters, brothers and other dependents; that during every minute of the entire year a small army of at least four thousand working people are idle as the result of industrial injuries, and that approximately 100,000 people receive personal injuries annually,—ranging from serious to severe and fatal,—we may get some idea of the importance of the work devolving upon the Industrial Accident Board. The wage loss per day in this Commonwealth from personal injuries is conservatively estimated at \$10,000; the economic loss per day at more than three times that figure, and the loss of future earning power, of opportunity to live out the full period of life, and to enjoy the society of family and fellow men, is incalculable.

While this legislation is of recent enactment, I believe that it has come to stay. Thirty-one states and two territories in the Union have adopted laws which provide for the payment of compensation to injured workmen and their families when the risks of employment cause personal injuries which deprive them temporarily or permanently of their ability to earn a living, and it is a source of pride and satisfaction to know that many of our sister states have used the Massachusetts law as a model and the basis of their own; many commissions entrusted with the investigation of this subject, and the carrying out of the law in states where it has been enacted, are constantly visiting this Commonwealth to obtain advanced ideas as how best to deal with their own acts, and to study the practical and successful manner in which the law in Massachusetts has been administered.



Perhaps in no other state has an elective act been so generally accepted by employers and employees alike as in Massachusetts; about 80% of the working people of this Commonwealth are covered by insurance under the statute, and the balance of these workers are favorably affected by the law, since the non-insuring employer is answerable for personal injuries caused to his employees, and stripped of the common-law defenses which have been heretofore referred to; because these defenses are no longer available, and the employer who is sued for personal injuries has no ground of defense if it can be shown that the injury was due to his negligence. Undoubtedly the comparatively small number of employers who have heretofore failed to become subscribers under the act will sooner or later practically all come within its provisions, thereby escaping the disadvantages under which they labor when sued at common law by an injured employee. The working people of Massachusetts have come to look upon the operations of the Industrial Accident Board as an industrial court, to which they may turn with confidence in the belief that their rights, and the rights of their families, will be safeguarded; they have shown a desire to see this important commission protected from all improper influences, and desire to have it kept out of the domain of partisan politics. This desire on their part is laudable when it is considered that the Board has almost an exclusive right to adjudicate the claims which arise out of injuries to the immense number of working people protected by the provisions of the law. Its decisions are not subject to review, except by the Supreme Judicial Court, they are final as to findings of fact; still if there is no evidence upon which such findings may rest, their decisions are subject to reversal by the Supreme Judicial Court on questions of law. The amount of work which is cast upon this Board is very large, necessitating frequent evening sessions in order that the urgent claims of injured workmen may be speedily adjudicated, that they may have the compensation which they may be entitled to receive.

The number of reported injuries has grown from 89,000 during the first year to more than 100,000 in the third year of the act, and even the latter high figure is certain to be increased because of the continued increase in the number of employers accepting insurance and reporting injuries to their employees. The number of employers who became insured has increased from 10,000 during the first year to 27,000 in the third year of the act. The number of employees who are covered by insurance has grown from 600,000 to 900,000. The number of arbitration hearings has increased from 400 to 1200. The number of conferences on disputed cases presided over by the members of the Board has grown, from an insignificant number during the first year, to 3000 in the present year. The

number of disputed doctors' bills has increased from less than a hundred during the first year to more than one thousand in the third year. The number of full Board cases has increased from 120 in the first year to 600 during the present year. The number of matters considered at each full Board meeting has increased from less than a dozen to forty. The number of agreements providing for the payment of compensation coming before the Board for approval has increased from 8000 during the first year to 25,000 during the present year. New problems constantly are arising regarding fees of physicians, charges of hospitals, rights of employees, rights of insurance, rights of employers,—all of which affect the general right of the public and the welfare of the Commonwealth, and have a material bearing upon the cost of insurance under those benefits which widows, orphans, parents and other dependents of employees, and the latter, themselves, may receive.

In the performance of these many duties, the Board is required to protect both the employer and the employee from any infringement upon the rights to which each is entitled under the act, and the fact that the Board has been able to administer the law fairly, despite the many problems arising because of its novel and complex provisions, speaks well for the integrity and efficiency of its organization and personnel. The Industrial Accident Board should not be hampered by changes due to political expediency, but should be encouraged to work out constructively the many problems which constantly confront it.

While this paper is already unconscionably lengthy, dreary and uninteresting, I feel as if I ought, before closing, briefly to refer to a few cases which have arisen in the English courts, as well as in our own, involving the construction of the act.

It is to be borne in mind that to bring a claim for compensation within the act it must appear that the employee received a personal injury, and that such injury arose out of and in the course of, his (the employee's) employment, and that the condition of the employee is due to the injury as a proximate cause.

The English act provides that the personal injury received shall be "by accident." These words "by accident" are not found in the Massachusetts statute. Take a few illustrations from the English courts: It has been held by them that nervous shock caused by accident was within the act, and that a collier who was overcome by the sight of injuries sustained by a fellow workman could recover upon the ground that mental, nervous or hysterical effects of an accident are just as much included as physical results.

It has been held that a man who was murdered was killed by "accident" within the meaning of the act. This decision was made by the House of Lords affirming the Irish Court of



Appeals. A collier working in a narrow seam which involved constant kneeling, a small piece of coal found its way up his trousers and worked into his knee, causing blood poisoning. Held to be within the act. A workman shifting lumber,—during the night planks froze together, and not realizing the fact, he ruptured himself in trying to lift a plank. Held the case was within the act. Death by lightning was held to be an accident; it was held by the House of Lords that heat stroke caused by the rays of heat from the boiler of a steamship, and which rendered a stoker in an enfeebled state more liable to attack, was an accident, and entitled the workman to compensation. A collier died from pneumonia following a chill brought on by having to wait for a considerable period, when overheated, near to a ventilator shaft before he could be brought to the surface. Held to be within the act. (5 B. W. C. L., 177, H. of L.)

It also has been held in England that injury caused by frost-bite is not within the meaning of the act. A contrary decision was recently handed down by our Supreme Judicial Court. A wool sorter contracted the disease of anthrax, a form of blood poisoning arising from a germ found upon certain animals. Held he was within the act.

The Supreme Judicial Court of Massachusetts is constantly reviewing cases under our act upon appeal. An employee was assaulted by a fellow workman, the latter at the time being intoxicated; the employee died as the result of the assault. Held that the injuries arose out of and in the course of his employment. An employee of a citizen, a resident of Massachusetts, was injured while out of this State. Held that the act had no extra-territorial effect, and that no compensation could be paid. An employee, the driver of a delivery wagon, after his day's work was over, was directed to drive his team to the stable. The following morning he was found some distance away in a swamp; he was unconscious, and died while in that condition. Held that his injury did not arise out of his employment. An employee at a gas plant became blind, caused by poisonous gases. Held to be within the act. An employee, a paint grinder, contracted lead poisoning. Held it was a personal injury and that he was entitled to compensation. An employee tripped while getting off an elevator and was thrown against the opposite wall of the hallway; later strangulated hernia developed and death followed. Held that the injury which caused the death arose out of and in the course of the employment. A workman, after his work for the day was ended, was offered a ride home in his employer's wagon, in accordance with a custom, and on the way he was hurt. Held that the ride was incidental to his employment and that the injury arose out of and in the course of the same. An employee, who worked nights on the seventh floor

of a building as a compositor in a printing office, where the men who worked with him were in the habit of going out upon the roof of an adjoining building owned by the employer, to cool off on hot nights; the employee was last seen alive about eleven o'clock p.m., and his body was found about four hours later on the ground six stories from the roof. It was held by the Supreme Judicial Court that his injury and subsequent death could be found to have arisen out of and in the course of his employment.

The constitutionality of acts passed for workmen's compensation has been passed upon by the highest court in many of the states of the Union, and has been uniformly sustained with one exception. The Court of Appeals of the State of New York declared the act passed by its legislature unconstitutional, on the ground that, being compulsory, it authorized a taking of property without due process of law, and was, therefore, within the constitutional inhibition. *Ives vs. South Buffalo Railroad*, 201 N. Y. 271.

An opinion was given to the Massachusetts Senate by the justices of the Supreme Judicial Court, upholding the constitutionality of our present act. In the course of this opinion it is said "There is nothing in the act which compels an employer to become a subscriber to the Association or which compels an employee to waive his right of action at common law and accept the compensation provided for in the act. In this respect, the act differs wholly, so far as the employer is concerned, from the New York statute above referred to. . . . Taking into account the non-compulsory character of the proposed act, we see nothing in any of these provisions which is not in conformity with the 14th amendment of the Federal Constitution or which infringes upon our constitution in regard to the 'taking of property without due process of law.'"

The law allowing compensation to workmen for injuries sustained in the course of their employment being of recent growth and development will undoubtedly require, from time to time, perfecting amendments. I believe it is a long step toward the betterment of social and economic conditions, and will not only result in the relief from destitution of thousands of injured workmen and their dependents, but will also be the means of the adoption of measures which will materially diminish the number of industrial accidents in Massachusetts.

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NEW ENGLAND BAPTIST HOSPITAL.—The annual graduation exercises of the New England Baptist Hospital Training School for Nurses were held at Ford Hall, Boston, on December 12. The principal address was made by Dr. Hugh Cabot, and Dr. George S. C. Badger presented diplomas to a class of eighteen pupil candidates.



## Original Articles.

### A CONSIDERATION OF WORKINGMEN'S ACCIDENT AND SICKNESS INSURANCE IN THEIR RELATION TO THE MEDICAL PROFESSION.\*

By F. J. COTTON, M.D., F.A.C.S., BOSTON.

I HAVE been asked to say something about the general problem of insurance, both as to health and accident, but realize that I am here principally because of my connection with the committee entrusted by the Council of the Massachusetts Medical Society with the task of looking out for medical interests involved in the impending legislation for compulsory sickness insurance of workmen.

I believe this form of insurance is coming, whether we like it or not, and that its coming bids fair to revolutionize medical practice in this State; probably not to the benefit of its practitioner.

It is time for us to wake up to this very grave problem; a time to do more than to vote for a motion that the chairman appoint a committee. Each of you must become a committee of one; you must inform yourselves as to what threatens and as to what *you* can do in this matter.

Now we have no experience with sickness insurance of this type in this Commonwealth or in this country, but we have had accident insurance, and should have learned something in the four years this law has been operative; for many of the problems of the two sorts of insurance are similar.

First, the law on accident insurance was passed while the profession was asleep; we were not invited and we did not rouse up and go to the party. Not only were our rights in the matter not safeguarded; they were not even mentioned; not even thought of.

Obviously this situation, as it affected the original bill, was not bettered by the changes which opened up its workings to certain interests that have never been noted for consideration of or respect for our profession or for its work.

When the bill became a law, we found ourselves in a very unfortunate predicament with no privilege safeguarded us under the law save the privilege of practising for nothing. Fortunately, the Industrial Board has been very fair-minded, has sought good medical advice and taken it, so far as was possible under the law, in regard to medical problems.

The efforts of the Board and of their medical advisory committee brought about a compromise, unsatisfactory to everyone, of course, but far better than the original situation; a compromise possible only because most of the insur-

ance companies were disposed to be very decent about it, and to forego their exact rights under the law.

Under this compromise, we have been living in reasonable peace until last spring, and might be going ahead not too unhappily were it not that one or two companies have refused to continue to waive any of their legal rights. This makes it hard for the other companies who still want to be decent, as it gives an unequal advantage in rate-making, and it has made the medical situation almost intolerable in many communities.

Just what this situation is you will hear from other speakers, who will outline their plans for betterment of the conditions, so I need not go into this further. The moral, however, is obvious!

Once we were caught napping; this must not occur again. We must see to it that we are considered and that our advice is heeded and our rights safeguarded in the adjustment of medical problems involved in impending legislation, and safeguarded in the bill to be passed; not petitioned for afterward. Lay control of medical work is not only unfair, but is stupid as well, and very apt to defeat its own ends.

Another point we have learned is that professional service is not all of it satisfactory; that some few practitioners fail in professional competency; others fail in that sense of co-operation in public service in which our profession, in its mass, has always been conspicuous. The failings of the medical profession in this matter have been overestimated, but experience of the last four years does indicate the desirability of medical supervision of work done under a general insurance scheme; mark you, I say, not lay supervision, but competent, disinterested medical supervision.

Another problem that has loomed large is the relation of hospitals to care furnished under any compensation law. In this State, some hospitals are on a private basis; some private with provision for charity patients also. In some of these the doctor is paid in full; in some he is paid on private cases, not on ward cases. But a large share of our hospitals were conceived as charities; are supported by benevolence; expect to run behind yearly, because they are dedicated to service. Such hospitals ask the doctor (and quite properly ask him) to give his services to charity patients, and in some instances, in the older charity hospitals, the staff are not paid for any of their work at all.

This variation in conditions has led to endless squabbles, and the answer is not in sight.

Trustees of charities and members of the professional staff of such charities have been unable to see why arrangements conceived for the relief of the unfortunate should be used to reduce expense accounts of commercial corporations.

No adjustment is in sight as yet, and this hos-

\* Read at a meeting of the Suffolk District Medical Society, October 25, 1916.



pital problem is one of the most difficult to adjust under any compensation scheme, whether it deal with accident or sickness compensation.

The suggestion has been made that hospitals establish industrial clinics on a pay basis; the work to be paid for by the insurer—doctors' payments included. This is feasible, and the only way apparent in which the big clinics, and many, at least, of the small ones, can be utilized without injustice. There are objections to it, but it is feasible. The present condition is likely to lead, particularly in out-patient clinics, to the swamping of facilities intended only for the hospital's usual clientele. Hospitals are usually undermanned, under-financed, and this situation is bad and must, if it get much worse, lead to poor work.

Another point is that we cannot rely on a *priori* judgment as to what the other fellow would do. *A priori* it seems obvious that the insurer would realize the purely commercial benefit in the long run of keeping up a high standard of surgical care. Some of the insurance companies have done so, and their care of their dependent injured has been intelligent and excellent.

In other instances, companies representing a considerable percentage of the risks written have shown no interest in the medical side, no interest in getting the injured man back to competency, and have seemingly regarded nothing save the keeping down of the expense account by any available method. So far has this gone that it was needful to pass an amendment providing that compensation could not be stopped arbitrarily without a board hearing.

So much for the part of our experience of four years past that should be of use to us when we face a new problem of insurance.

Now to come to the question of sickness insurance proper. What is proposed?

The bill best worth discussing, because it was before our legislature last year, and is likely to come up again in about the same form, is the so-called Doten Bill.

This is really a bill conforming to the draft prepared by the American Association for Labor Legislation. This measure has been introduced in the legislature of a number of the states in practically the same form. The proposals of the "Committee on Social and Industrial Justice of the Progressive National Service" are along the same line.

The Doten Bill proposes a sickness benefit of two-thirds of the wages of the sick worker during his illness; to start with the fourth day of disability; to cover not over 26 weeks in any one year. Medical care is to be furnished him throughout this period, or such part of it as corresponds to his actual time of disability.

Maternity benefits are provided for and a funeral benefit of \$50.00.

The insurance is to be compulsory, and to be financed by contributions of 40% from the em-

ployer; 40% (or less in the poorly paid grades) from the employee; 20% from the State. Control is to be vested in bodies elected from both employees and employers.

The "carriers" of insurance proposed are mutual associations; locals covering a given community, or in the larger centres, corresponding to trade units in the cities.

Participation by commercial insurance companies is not provided for or contemplated.

This is a rough sketch of the provisions.

The general scheme sounds like progress, and it is, perhaps, no part of our function as a profession to pass on the question as to whether it should be enacted into law. Certainly we are not going to oppose it, unless it appear that the medical care, on the excellence of which the benefits to the workman must depend, is going to be badly provided for, unless we are going to run the risk of being forced into inefficient working methods.

As I see it, however, it would be better to have no such insurance than to have it with medical work reduced to the level of lodge practice methods.

Now what of the medical plans?

The American Association for Labor Legislation asked the coöperation of the American Medical Association. The A. M. A., appointed a committee who drafted a report to the Judicial Council, which was published in the *Journal of the American Medical Association* for June 17, 1916.

The third edition of the bill of the American Association for Labor Legislation, published in May, 1916, incorporated some part of this report, and the following are the provisions for the medical administration as there published.

Proper provision for medical care is one of the most important problems in the efficient administration of health insurance. The tentative plan—many of the details of which should be left to regulations to be made by the commission and the medical advisory board—allows each fund or approved society to select the method of administration suitable to local conditions. Where the fund chooses the panel system, any legally qualified physician may join the panel, and the insured workmen shall have free choice among physicians undertaking insurance practice. Since this system may not prove practicable in all districts, freedom should be left to the funds to provide medical care through other methods, such as salaried physicians, among whom there should be reasonable free choice, through physicians responsible for specified districts, or through any other method approved by the commission.

To avoid some of the recognized shortcomings of foreign systems, certain safeguards have been inserted. For instance, the limitation placed upon the number of insured patients whom a physician may treat will go far toward preventing a repetition of the British experience, whereby, under a system of free choice of physician, one-fifth of the doctors are, in many towns, treating one-half the insured population. Moreover, since this limitation is calculated with reference to the probable



number of sick days which a doctor is likely to have in charge, it will prevent extreme cases of overwork, caused by too large numbers of insured patients. In the interests of patients, doctors and funds alike, it is highly desirable to separate the duty of certifying a person as eligible for cash benefit from that of treating him, and for this and for supervisory purposes, a fund may employ a medical officer.

The question of method of payment to physicians is an especially complex one, on which the committee has not reached definite conclusions, although it offers the following points for discussion:

The capitation payment, of so much per person per year, common now in lodge practice, has in it elements which bring about an undue amount of work, and, in turn, forces neglectful, hurried service to the patients. Another plan is that of engaging a salaried physician, similar to the arrangements now made by many railroads. Since no fund could employ many physicians, the limited choice of doctor might be unfavorably regarded by some of the insured persons. The advocates of this system claim that it offers peculiar advantages of selecting the physicians most desirable for this work, and thus of obtaining better service. A third method, payment per visit, is also possible. To the medical profession this method may be preferable because it establishes a quantitative relation between services and remuneration, and to the patient, because it probably secures more careful attention from the doctor, and thus eliminates the chief fault of the capitation system. On the other hand, medical care under this system may put a heavier burden upon the funds administering benefits. A compromise between this and capitation may be made by which a total sum, calculated on the per capita basis, is distributed among physicians in accordance with the services rendered by each. Instead of the elaborate fee schedule common under workmen's compensation, a more simple arrangement is made, whereby a physician is paid pro rata for office and house visits. Although this effectively meets the chief objection to a capitation payment, it may be undesirable to the physician, since the actual payment for each visit may decrease in proportion as work increases. However, the provision of a fixed amount, divided according to services, has administrative advantages, since the total amount paid for medical aid is a fairly constant charge upon each fund.

But whichever system be adopted, one thing is clear: all medical service to the insured will be paid for, including the unremunerated dispensary practice of today. The problem becomes one of deciding which method of arranging for the 100% collections of the future is preferable, in the interests alike of patients, doctors and administrators.

Representation of the medical point of view in the administration is important. This need is met by the presence of a doctor on the Social Insurance Commission and by provision for consultation with representatives of the medical profession on medical matters. This secures a hearing to the medical point of view on both state and local problems.

The necessary supervision may be obtained through medical officers employed by the funds, while matters in dispute may be referred to special committees, both state and local. To these commit-

tees, representing the various interests, power might well be given to remove undesirable practitioners from insurance practice, subject to an appeal to the commission.

**SECT. 7. *Minimum Benefits.*** Every carrier must provide for its insured members as minimum benefits: medical, surgical and nursing attendance; medicines and surgical supplies; cash benefits; maternity benefits; funeral benefit; medical and surgical attendance and medicines for dependent members of their families.

**SECT. 8. *Beginning of Right.*** Insurance, with the exception of maternity benefits, begins with the day of membership. The maternity benefits shall be payable to any woman insured against sickness for at least six months during the year preceding the confinement, or to the wife or widow of any man so insured.

**SECT. 9. *Medical, Surgical and Nursing Attendance.*** All necessary medical, surgical, and nursing attendance and treatment shall be furnished by the carrier from the first day of sickness during the continuance of sickness, but not to exceed 26 weeks of disability in any consecutive twelve months. In case the carrier is unable to furnish the benefit provided for in this section, it must pay the cost of such service actually rendered by competent persons, at a rate approved by the commission.

**SECT. 10. *Medical Service.*** The carriers, subject to the approval of the commission, shall make arrangements for medical, surgical and nursing aid by legally qualified physicians and surgeons, and by nurses or through institutions or associations of physicians, surgeons and nurses. Provision for medical aid shall be made by the carriers by means of either:

1. A panel of physicians, to which all legally qualified physicians shall have the right to belong, and from among whom the patients shall have free choice of physician, subject to the physician's right to refuse patients on grounds specified in regulations made under this act; provided, however, that no physician on the panel shall have more than 500 insured families nor more than 1000 insured individuals;

2. Salaried physicians in the employ of the carriers, among which physicians the insured persons shall have reasonable free choice;

3. District medical officers, engaged for the treatment of insured persons in prescribed areas.

4. Combination of above methods.

**SECT. 11. *Medical Officers.*** Each carrier shall employ medical officers to examine patients who claim cash benefits, to provide a certificate of disability, and to supervise the character of the medical service in the interests of insured patients, physicians and carriers.

**SECT. 12. *Medical and Surgical Supplies.*** Insured persons shall be supplied with all necessary medicines, surgical supplies, dressings, eyeglasses, crutches, and similar appliances prescribed by the physician, not to exceed \$50 in cost in any one year.



SECT. 13. *Hospital Treatment.* Hospital or sanatorium treatment and maintenance shall be furnished, upon the approval of the medical officer of the carrier, instead of all other benefits (except as provided in Section 16), with the consent of the insured member, or that of his family when it is not practicable to obtain his consent. The carrier may demand that such treatment and maintenance be accepted when required by the contagious nature of the disease, or when, in the opinion of its medical officer, such hospital treatment is imperative for the proper treatment of the disease, or for the proper control of the patient. Cash benefit may be discontinued during refusal to submit to hospital treatment. Hospital treatment shall be furnished for the same period as cash benefit. This benefit may be provided in those hospitals with which the funds and societies have made satisfactory financial arrangements, which have met the approval of the Social Insurance Commissioners, or in hospitals erected and maintained by the funds and societies, with the approval of the commission.

SECT. 14. *Arbitration Committee.* All disputes between the insured and physicians, or between funds and physicians concerning medical benefits shall be referred to special committees composed of representatives of the interests concerned, with an impartial chairman appointed by the commission, with an appeal to the commission.

SECT. 15. *Cash Benefit.* A cash benefit shall be paid, beginning with the fourth day of disability on account of illness; it shall equal two-thirds (66 2/3%) of the weekly wages of the insured member. It shall be paid only during continuance of disability, and shall not be paid to the same person for a period of over twenty-six weeks in any consecutive twelve months.

SECT. 16. *Cash Benefit to Dependents.* A cash benefit equal to one-third of the wages of an insured member receiving hospital treatment shall be paid to his family or other dependents while he is in the hospital.

SECT. 17. *Periods of Payment.* Cash benefit shall be paid weekly where possible, and in no case less frequently than semi-monthly.

SECT. 18. *Maternity Benefits.* Maternity benefits shall consist of:

All necessary medical, surgical and obstetrical aid, materials and appliances, which shall be given insured women and the wives of insured men;

A weekly maternity benefit, payable to insured women, equal to the regular sick benefit of the insured, for a period of eight weeks, of which at least six shall be subsequent to delivery, on condition that the beneficiary abstain from gainful employment during period of payment.

SECT. 19. *Funeral Benefit.* The carrier shall pay the actual expenses of the funeral of a deceased insured member, as arranged for by the family or next of kin, or in absence of such by the officers of the fund, up to the amount of \$50. The funeral benefit shall be paid in case of death of a former member while in receipt of cash benefits, or death within six months after discontinuance of

cash benefits because of the exhaustion of the time limit, provided he has not within those six months returned to work.

SECT. 20. *Additional Benefits.* The carriers may grant additional or increased benefits with the consent of the Commission.

SECT. 21. *Extension of Insurance.* When contributions cease on account of unemployment not due to sickness, the insurance shall continue in force for one week for each four weeks of paid-up membership during the preceding 26 weeks.

The first thing that interests us particularly is Section 10, allowing for adoption:

1. Of the panel scheme; a panel including all decently competent physicians in a given district, with right of free choice of physician by patient.

2. Of the limited panel, with "reasonable free choice."

3. District medical officers.

From our point of view, this is pretty broad and the possibilities of Plan 3 (of district officers) becoming honeycombed with politics of the municipal corporation or trade-union brand is considerable.

Plan 2 is something less open to this sort of thing, but might work grave injustice to many physicians in certain communities.

As to Plan 1, it must obviously admit some of the less competent physicians, but it is the plan that commended itself to the committee of the American Medical Association and to the committee of the Massachusetts Medical Society.

It is perfectly evident that if we are to have the open panel, with free choice, we must have supervision and some form of control.

The plan suggested is to have medical officers employed by the funds, to inspect and certify as to rights to benefits; also to suggest consultations, removal to hospitals, etc.

Beyond this there are to be committees (mixed lay and medical committees) to sit on disputes; to prune out the medical panel, if need be (this last is suggested, not incorporated in the text of the draft), from the rulings of which appeal may be taken to the commission.

Also Section 13 provides for hospital care in cases approved by the medical officer of the fund in hospitals with which previous arrangements have been made.

There remains three points for us to discuss in the medical situation:

First, Section 13 calls for a previous arrangement with hospitals under which patients may be cared for. This is open to about the same abuses as the hospital situation today in accident work. It should be provided definitely that such arrangements in order to get the approval of the commission must provide, not only for hospital care but for medical fees as well.



Second, there is no provision for consultants. Provision, in form of a special panel, perhaps, must be made for consultant specialists in the various lines. This has been done abundantly in Germany, and is one reason why the system there has worked so well.

Third, the commission should have the advantage of expert opinion on cases in which the patient's ability to return to duty is disputed. The system of reference of such patients by the Board to impartial physicians for examination and report has proved, in accident cases, to be of service in clearing up obscure cases, and particularly in suggesting procedures to get the patient back to usefulness. It would be a pity not to have some similar safeguard in a sickness insurance law.

Adjudication of such matters by a lay board has proved unsatisfactory in the past, as one might expect. Medical matters should be in medical hands, and there should be an expert medical judgment, above that of the district supervising doctor, obviously.

To sum up, I think we must accept this legislation as bound to come, sooner or later: quite likely sooner.

If the bill of the American Association is to be reported, we should try to make sure that the open panel scheme should be recognized as the best, if not the only scheme; that *proper* hospital contract arrangements should be specified, that provision for a panel of specialist consultants be made; that the commission be enabled to call on impartial examiners in cases in dispute. All these things should go into the bill.

If they cannot be persuaded into it, we should place ourselves in position to have them proposed as amendments. Adjustment of these details by the commission later will hardly do; they will have enough details to settle.

If an attempt is made in amendment of this bill, or in other bills, to open this scheme up to commercial companies, we should place ourselves in position to fight it, not only because it hits us, but because all past experience elsewhere seems to show that the only possible scheme for proper administration of this very complex matter is by central control, through local associations.

Certainly we do not wish to stand in the way of social progress, but it would be better to postpone this matter a little than to have hasty legislation first and hopeless complications afterwards.

**POLIO MYELITIS IN MASSACHUSETTS.**—Three new cases of poliomyelitis were reported in Massachusetts on December 11, one each in Boston, Brookline and Waltham, making a total of twenty-two cases during the first eleven days of the month.

## THE HISTORY AND OPERATION OF THE MASSACHUSETTS WORKINGMEN'S COMPENSATION LAW.\*

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The medical profession, in a discussion of new forms of social, perhaps more properly called welfare, insurance, may well profit by their experiences under the present Workingmen's Compensation Law.

It is a step in the right direction when the medical profession, officially and unofficially, is properly represented at the hearings on social insurance. If the medical profession had been as well represented while compensation hearings were under way, and at the time when rates were being fixed by other commissions, a number of the things which led to dissatisfaction and friction could have been materially modified.

Mr. Justice Crosby of the Supreme Judicial Court of Massachusetts at a meeting of the Berkshire District Medical Society, on June 29, 1916, made a most excellent presentation of the law on workmen's compensation, and its application.

I am sorry that this paper has not been printed for the use of the Medical Society and sincerely hope that it will be, that the legislative committee may have the benefit of it before the legislature meets. The part assigned me at this meeting is to deal with something of the history and operation of the Massachusetts compensation law.

The need of protecting the workman has long been recognized.

Manifestations of this protection are found in the laws regulating the hours of labor; sanitation of factories; child labor legislation; minimum wage; and adequate housing.

Taking cases of mental disease out of the almshouse pauper class and transferring to state institutions where their needs may be studied, is another form of interest.

While the city and the state care for tuberculosis, the efforts for pure food, pure water and pure air are for the protection not only of the worker but for protection of the home from which the future worker must come. All of this legislation, like most moves for progress, was strenuously resisted, but as the greatest good for the greatest number has prevailed, it is but natural that it must continue with education and enlightenment.

Compensation movements, along with demands for other forms of social insurance, had been growing in Germany since 1870, but having been the workmen's compensation act of 1884 but was really only a matter of academic interest in this country.

Although the action of the General Court of



1910 (Ref. Chap. 120, Resolves 1910) in providing for a commission to investigate the subject and to report the draft, led definitely to the passage of the act, public opinion had gradually been growing in this direction for a considerable period.

England in 1880 passed an employers' liability act, and in 1887 the first employers' liability law in the United States was passed by Massachusetts. This act had for its purpose the modification of the principle of fellow servant negligence then operative under the common law. This in no way solved the injustice of dealing with industrial accidents, but indicates that at least the system at that time was not considered satisfactory. Very little was understood in this country with reference to the compensation idea until after the passage of the first compensation act in England in 1897.

The English compensation act of 1897 provided that compensation should be paid by the employer to the injured workman, irrespective of negligence, direct or contributory, and applied to most industries. In 1900 the law was extended to agriculture and in 1906 to practically all persons in service.

Later, certain industrial diseases were given the standing of accidents within the meaning of the law.

In 1904, an attempt was made to pass a compensation act in this state modelled after the compensation law of England. This law failed of passage. Two reasons have been assigned as the cause: first, public opinion had not at that time been sufficiently aroused to the importance of the subject to understand the question thoroughly, and second, the fact that no state other than Maryland had yet taken any action along this line, raised the old fear which always has been existent, and is still when any new form of social legislation is proposed, namely, that Massachusetts industry is in danger of being driven from the field through competition. Each year after the proposal of this law in 1904, an attempt was made to pass a similar measure, but without success.

In 1908 an act was passed which allowed employers to enter into a contract with employees to substitute a voluntary compensation law in place of the legal liability under the employers' law. This contractual compensation method could be made effective after approval by the board of conciliation and arbitration. Contracts of this nature could be effective only for one year, without renewal, so that the system did not work out in practice, and was not utilized.

The real beginning of the present compensation act in Massachusetts is found in the action taken under Chapter 120, Resolves of 1910. It was resolved that "the public good requires a change in the present system of determining the compensation of employees for injuries sustained in industrial ac-

cidents, and that the commonwealth ought to provide different and more suitable relief; . . . . . " A commission was appointed whose term of office was extended by two other acts in 1911, to investigate the subject, and to report a draft of a compensation act, and finally, after exhaustive investigation and hearings, upon the matter, a law was passed which became effective on the first day of July, 1912.

Although the basic principles of this type of legislation may be variously expressed, it is of interest and value to learn the point of view of the investigating commission on the matter. This may best be done by quoting from their report. "The chief object of compensation laws is to provide a definite scale of payments to employees injured in industry. . . . . The Massachusetts law may be briefly characterized as an elective compensation insurance law giving compensation for all injuries arising out of employment irrespective of negligence except those due to the serious and wilful misconduct of the injured employee. The basic principle of the act is that the cost of injuries incidental to modern industry should be treated as part of the cost of production. The act was framed with that end in view. . . . . The law will operate to prevent injuries."

With reference to the administration of the law the same report states in another place as follows: "The commission was of the opinion that the controversies under the act should not be dealt with in the ordinary courts. . . . . the commission believed that it was necessary to have an administrative board intrusted with the execution of the law. . . . it was thought unwise to allow the law to be administered by the judges of the courts, as the details of administration would differ widely in different courts. This difficulty has been experienced in England. The Industrial Accident Board is designed to provide a medium for the settlement of controversies which will act uniformly throughout the Commonwealth."

"The loss arising from the present system of determination of controversies, with its great waste of money in connection with litigation, will be materially reduced. The difficulty under the new law will not be so much in the determination of matters of legal liability as in the ascertainment of the physical incapacity of the injured man."

"The controversies under the act will relate largely to the extent and duration of the injury. The successful administration of the act requires the assistance of skillful physicians and surgeons of the highest integrity. This phase of the situation has occasioned difficulty in other countries. The details of this subject must be determined by the Industrial Accident Board as they arise in actual practice. The emphasis will be laid *not*, as heretofore, *on the lawyer, but on the doctor.*" [Italics are mine.]

"In addition to its duties with relation to



controversies under the act, the Industrial Accident Board has other important functions. . . . . The statistics gathered by it will be of great value, especially in determining the physical cause of the injury. It is evident that the cost of the new law will depend largely on the success of employers in preventing accidents."

"The Industrial Accident Board can render invaluable service to employers by co-operating with them in the practical study of accident prevention. It is the Board's duty, also, to supervise the rules for accident prevention, established by the Massachusetts Employees Insurance Association. This branch of the Board's duties will be of great public consequence. . . . . Another important function of the Board will be the supervision of agreements for compensation. It is believed that a large number of cases will be disposed of in this manner, and the Board must be careful to see that the rights of the parties are safeguarded." (The report of the Commission has been quoted at length for the purpose of showing the point of view from which the work of drafting the compensation act was developed.)

The next step is to trace in a general way the history of the operation of the law in practice, and to indicate some of the changes which have been made through subsequent legislation. As originally passed, the compensation act provided for a board of five members and a secretary. Clerical assistance and other operating expenses were provided for by an appropriation of \$10,000, an amount really insufficient for carrying on the vast amount of work for one month. No provision was made for a medical adviser, although admittedly a great part of the successful administration of the act was dependent on the determination of questions having to do with the physical incapacity of the employee, and the relation between a condition of disability and an actual or alleged industrial injury.

No provision was made for a corps of inspectors or investigators for the work of investigating the causes and prevention of injuries, and facts to assist the Board in enforcing the speedy settlement of cases. In other ways, the original organization might have been better equipped for carrying on and developing the work along the lines of thought which really underlie the compensation act. Some of these deficiencies in the first law were later adjusted, as experience developed the need.

A brief review of the accident experience in the state since the act went into effect is advisable as showing the extent of the problem. In the first four years of the act, approximately 417,000 injuries have been reported to the Board. About 11 million dollars have been paid or are to be paid on account of the injuries which arose in this period. Of this amount 22 per cent. has been paid as medical benefits, or about \$2,420,000.00. In the first year of the

act, approximately 81 per cent. of the injured employees were insured under the act; the number now insured runs between 90 and 95 per cent. In the first year of the act the average number of reports received per month was about 7,500; in the second year the monthly average was 8,200; in the third year the average was 7,100; in the fourth year the average was 11,475; and for the first quarter of the fifth year the monthly average is 14,000. Roughly speaking, at least sixty per cent. of the cases require some sort of medical attention.

Around 20 per cent. of the cases have a disability sufficient to entitle them to compensation. The cost of non-fatal cases expressed in terms of compensation is more than the cost of fatal cases and medical attention in all cases combined. In other words, more than half of the money expended in benefits goes to the payment of compensation to injured employees while undergoing the process of repair, or to those whose condition is beyond repair under the present condition.

In the course of the operation of the act, in addition to specific amendments made there have been decisions under the act, which have made definite the status of cases not easily determined to be within the scope of the law. The most important example of this is found in the application of the law to cases of occupational diseases, developed by the Hurle and Johnson cases. (Ref. Bulletin of Ind. Ac. Bd.)

The original act provided, as benefits, medical attention for the first two weeks after the injury, and the payment of compensation at the rate of fifty per cent. of the average weekly wages. The act was later amended (in effect October 1, 1914) so that in unusual cases medical attention might be provided beyond the period of two weeks; and the rate of compensation was increased to two thirds of the average weekly wages, and the period of benefits in fatal cases was increased from 300 weeks to 500 weeks. On the first of January, 1917, another amendment will be in effect, providing a ten-day waiting period, instead of the period of two weeks, so that the injured employee will soon be entitled to his first weekly payment on the 17th day after the injury, instead of waiting until the end of the third week.

There is also a provision of law that compensation shall be paid, in spite of appeal, unless otherwise ordered under Chapter 132, Acts of 1915, and an amendment, Section 4, Part 11, as amended by Chapter 90, General Acts of 1916, that when compensation shall have begun, it shall not be discontinued except by the written assent of the employee or the approval of the Board or a member thereof. In effect Jan. 1, 1917.

Probably the greatest factor in the satisfactory carrying out of the Massachusetts law has been its intelligent development along medical lines.



The old form of controversy, by presenting witnesses for and against the claimant, so that the man's rights depended upon the weight of the evidence presented at a hearing, has been materially modified by the naming of so-called impartial physicians. It was found that the malingering or fakir in Massachusetts was almost an unknown quantity, and that when a man came to the Board with a claim, 99 times out of 100 it was a just claim. The question then came on selecting doctors to examine these claimants, with the idea that a specialist in restoration of function was needed rather than a doctor who would say, "yes, the man is disabled," or "no, the man is not disabled." In the early days of the act, the insurance companies did not avail themselves of the impartial examiner, because examiners were not picked out along special lines. With the advent of the medical adviser, taking office in December, 1914, there was a great increase in the amount of work the insurance company put up to the medical adviser for aid in solving.

It is, of course, manifestly impossible for the medical adviser to examine all disputed cases, or even a small portion of them, and if it were physically possible, it would be an extremely unwise, not to say dangerous, thing to have any man placed in the position of examining accident cases in conference, again to express his opinion at a formal hearing, and then to insist to the full board that his opinion was the end of the medical law and must be accepted. The great success of the Accident Board has come from the utilization of the best medical brains in the Commonwealth. The medical profession should consider it an honor to serve as an impartial examiner, and men should be willing to make some sacrifice fully to preserve this feature of the law.

It has been, and is, to the credit of the medical profession that they are loath to discuss in terms of dollars and cents their service to the individual or to the community, but the changing position of the medical profession, brought about by the increase and concentration of population, by the ever-widening influence of state medicine, the loosening of the ties between the physician and the patient, the gradual submergence of the family physician,—all bring us face to face with need of change and readjustment to meet modern conditions.

A well-paid medical service will produce the best results.

Money is needed for the proper maintenance of the doctor's family; money is needed for the proper maintenance of equipment, books and magazines; and money is needed to provide the opportunity of keeping abreast of progress by intercourse with doctors at a distance by medical society attendance.

If we consider the law of 1912 from the doctors' standpoint, the small consideration ac-

corded to the medical profession is extremely striking.

The law consisted of 5 parts and 76 sections.

Part I of the law consists of 5 sections under modification of remedies.

Part II consists of 23 sections, of which Section 5 is devoted to the medical profession, and which reads as follows:

"During the first two weeks after the injury, the association shall furnish reasonable medical and hospital services and medicines when they are needed."

Section 19, authorizing an examination of the injured man by a physician or a surgeon sent by the association or subscriber, reads as follows:

"After an employee has received an injury, and from time to time thereafter during the continuance of his disability, he shall, if so requested by the association or subscriber, submit himself to an examination by a physician or surgeon authorized to practice medicine under the laws of the Commonwealth, furnished and paid for by the association or subscriber.

"The employee shall have the right to have a physician, provided and paid for by himself, present at the examination. If he refuses to submit himself for the examination, or in any way obstructs the same, his right to compensation shall be suspended, and his compensation during the period of suspension may be forfeited."

Part III consists of 18 sections, and has one section relating to physicians—Section 8—which reads as follows:

"The Industrial Accident Board or any member thereof may appoint a duly qualified impartial physician to examine the injured employee and to report. The fee for this service shall be five dollars and travelling expenses, but the Board may allow additional reasonable amounts in extraordinary cases."

Part IV consists of 24 sections and contains nothing relating to doctors.

Part V consists of 6 sections, miscellaneous provisions, largely of definitions.

In addition to that, Chapter 311 authorizes mutual insurance companies to transact the business of employers' liability insurance, so-called, and Chapter 666, Acts of 1912, is an act relative to the insurance of compensation to employees for personal injuries received in the course of their employment.

The rules formulated by the Board under this law are eight, none of which have to do with the rights of the doctor. Hardly a word of the rights of the individual medical practitioner.

Under Section 13, Part III, "fees of attorneys and physicians, for services under this act, shall be subject to the approval of the Industrial Accident Board." Under this section the Board made a ruling that fees should not be charged an injured party whose employer was



insured, larger than the injured party would be charged were he not insured.

As this ruling was extremely unsatisfactory, and as other medical administrative problems annoyed the Board, they were obliged finally to turn to the medical profession for help, and after a meeting at the State House (Ref. Bulletin No. 4, Industrial Accident Board, April, 1913) appointed, at the recommendation of the Mass. Medical Society, two members, Mass. Homeopathic Society, two members, and three members were named by the Board; Dr. F. J. Cotton of Boston and Dr. F. W. Anthony of Haverhill, named by the Mass. Medical Society; Dr. S. H. Calderwood of Boston and Dr. S. E. Fletcher of Chicopee, named by the Mass. Homeopathic Society; Dr. W. H. Ruddick of South Boston, Dr. F. E. Allard and myself were appointed from the standpoint of the Board. This committee considered the matter in a comprehensive way and arrived at certain conclusions after a study of a large number of doctors' bills, and hospital and nursing disputes.

The work of this committee, while not fully understood, led to much of the constructive legislation which followed and to this committee the medical profession should ever be grateful.

I will briefly review their recommendations and the underlying reasons for the recommendations, because further constructive work is possible. (Ref. Bulletin No. 6, Industrial Accident Board, Nov., 1913.)

"First.—That a permanent advisory medical committee is necessary."

To this committee the Industrial Accident Board can turn for aid in establishing principles from the medical standpoint. It is not designed to do the work of the Industrial Accident Board or its members, and it is not to sit for continuous judgment upon details, but to supply the basis upon which the Accident Board may apply the law.

"Second.—That we consider it inexpedient to have a medical man as a member of the Industrial Accident Board."

This was to be taken only as of the time at which the recommendation was made. It was left open for future experience and development to say whether or not medical interests would be properly conserved by an entire board of lay men.

"Third.—That the Industrial Accident Board should have a consulting surgeon upon whom should fall the duty of detail work in preparation of matters to be laid before the advisory committee. Matters in dispute regarding services and fees of physicians should be referred to this committee for recommendation."

This was followed by enactment of the law providing for a medical advisor who acts as a consultant with the medical advisory committee, with hospital committees and with individual doctors in endeavoring to secure fair treatment along the lines recommended by the med-

ical advisory board, and to advise the board or any member when called upon.

"Fourth.—That insurance companies be requested to provide suitable blanks for notifications as well as specifications of services rendered by physicians."

A large part of the friction between doctors and insurance companies in regard to bills arose from the fact that the insurance companies did not know the doctor's side of it, and while it led to a little more work on the part of the doctor, it removed a large amount of friction.

"Fifth.—That industrial insurance companies be encouraged to allow all reputable physicians to render services in industrial accidents, provided they are willing to render such services upon a reasonable basis."

This was acceptable to all but a few insurance companies and all insurance companies in some measure have accepted the spirit of this in whole or in part.

The Peccot decision has changed the attitude of some companies. (Ref. Bulletin Ind. Ac. Bd.)

"Sixth.—That the Accident Board should make arrangements with which the insurance companies should cooperate; that any physician whose bill is in dispute may appear before a representative of the Accident Board within a reasonable distance of his home."

Not only was this recommendation adopted, but the law was so amended that it gave the physician the right to ask for a hearing on his bill independent of the employee for whom the service was rendered. Under the first law a doctor had no right to ask for a hearing unless the employee asked for it for the doctor.

"Seventh.—That the Accident Board shall provide for medical referees by districts."

This section is capable of further elaboration, and while the essence of it is preserved in the naming of impartial doctors, the impartial doctor has not been utilized along the line of the medical referee under the English law or as a referee sitting with a committee of arbitration.

"Eighth.—That fees paid by the companies should not be less than the average minimum fee in the locality in which the service is rendered."

This refers to fees paid to doctors, not to contracts between doctors and the insurance companies. This took into account that many medical and surgical fee tables, established by local medical societies, had perhaps been based upon the average income of the so-called better classes and were not generally applicable to working men, who form such a large part of the free hospital and dispensary service or who turn to fraternal organizations or hospital associations for low cost service.

"Ninth.—That charges up to \$50 for major operations are not excessive."

This did not fix a maximum, but made possible other payments based upon circumstances.



"Tenth.—That physicians appearing at hearings before the Board shall receive the compensation as provided for under section 8, Part III, of the act."

This was designed to pay a physician a little higher rate than was provided in Section 3, Part III; the fee for attending as a witness before the Industrial Accident Board shall be one dollar and fifty cents a day; for attending before an arbitration committee, fifty cents a day; in both cases five cents a mile for travel out and home."

"Eleventh.—That services rendered by lodge physicians be paid for, provided it is not inconsistent with the rules of the order."

The status of the lodge physician is a very difficult one upon which to pass, but as the choice of lodge physicians, to which a member is obliged to go, is somewhat similar to the insurance company providing a man to whom the employee might be obliged to go, the committee left the matter open.

"Twelfth.—That specialists, established and recognized by the profession as such, may receive special rates for their work, provided the case requires special skill."

This requires no comment.

"Thirteen.—That the ruling previously made by the Accident Board that 'fees should not be charged an injured party whose employer was insured larger than the injured party would be charged were he not insured,' should be interpreted to mean that in a given accident the fee paid by the insurance companies for services should not be less than the average minimum fee for similar services in the locality in which said services are rendered."

Was construed by the Accident Board in conjunction with recommendation eight.

All of these recommendations have as far as possible been carried out by the Industrial Accident Board, and form the basis of substantially all rulings on medical matters except as to hospitals. A special hospital committee made recommendations as to hospital care, and hospital charges, somewhat modified by a second hospital committee two years later. It is very evident that in the relation of general practitioners to hospital cases, the hospital to the workman, and the staff to the hospital, there is no uniformity, and changes are necessary.

It is impossible in the twenty minutes allotted to cover thoroughly even the essentials of the compensation law.

In previous articles, *The Medical Aspects of the Workingmen's Compensation Act*, in the *BOSTON MEDICAL AND SURGICAL JOURNAL* of Sept. 21, 1916, and *The Restoration of the Working Capacity of Injured Employees*, in the *BOSTON MEDICAL AND SURGICAL JOURNAL* of Oct. 7, 1916, I have covered other aspects of this subject.

There are two other phases which need to be covered:

One concerning specific payments for specific injuries. One is about the duty of the doctor in filing a notice of injury to protect both the patient and himself and how the doctor could materially aid both the workman and the compensation board by follow-up observation in cases which may be entitled to specific compensation.

These I hope to be able to cover in a future paper.

The entire machinery of the Board has but one aim, and that is so to administer the Workingmen's Compensation Act as to mete out justice to all, bearing in mind the fact that the highest court in our Commonwealth has stated that the law is a humane one; that it is to be interpreted broadly and liberally; and that the benefits provided thereby must not be made illusory, but rather that the relief granted must be substantial.

All of the human misery which springs from industrial accidents should be eliminated, if possible; and when all of us have every incentive, from the point of view of cost and human welfare, no stone should be left unturned to bring about the end to which all roads lead,—safety to life and limb and the conservation and rehabilitation of the victims of industrial accidents.

#### WORKINGMEN'S COMPENSATION FOR ACCIDENT AND SICKNESS, FROM THE POINT OF VIEW OF THE GENERAL PRACTITIONER.\*

By W. H. MERRILL, M.D., LAWRENCE, MASS.

*Mr. President, Fellows of the Massachusetts Medical Society:*

THE invitation to meet with you and hear the discussion of subjects so vital to the profession is a highly prized one. I assume the invitation came to me because I live in one of the four or five largest industrial communities in the State,—communities where the profession is most profoundly affected by these socio-medical laws, and proposed laws. Nearly one-half of the people in Lawrence are subject to the operation of the Compensation Act. The desire you manifest to hear all sides of this problem which, as physicians, enters but little into your own work, is a pleasing token of your catholic interest in all things that affect the medical profession.

The announcement that I would attempt to present the general practitioner's views on these questions may lead to some misunderstanding, for I have done no general practice for twenty years. If I fail to get the viewpoint of the general practitioner, I hope he will not

\* Read at a meeting of the Suffolk District Medical Society, October 25, 1916.



be criticized for the things I say which do not represent his thought, and that others will present the points he considers important, which I fail to.

There are two reasons why I am willing to attempt to voice the views of 90% of the members of the Massachusetts Medical Society. First, my admiration and respect for the general practitioner as I know him. My debt to the physicians who specialize is great, and I hope to be always very grateful to them for having placed their splendid skill so freely and sympathetically at the disposal of my family and myself; but to the physician and friend, the general practitioner, who has cared for us in illness and in trouble, even a deeper sense of gratitude is felt. He may guess at times or often, but the shrewdness of his guesses on the points most vital to the comfort and life of his patient is a perpetual source of surprise and admiration to me. The relations which beget this feeling may not exist in large cities, but they are a very real part of life in the small cities and towns, and if not present in large places, their absence is a part of the price paid for other advantages. The second reason is due to the chance which made me chairman of the Essex North District Medical Society at the time the Compensation Act became effective. The membership of Essex North is composed of more than 90% general practitioners, and it seemed to me the duty of its officers to get, and attempt to represent, their views.

In appraising the conditions arising under the law it should be borne distinctly in mind that the employer and the insurance company are two distinct factors. Some misunderstanding is due to lack of appreciation of this distinct separation. The insurance company acts as the financial agent of the employer, but in the wider important relations in the field of humanity the insurance company does not act, and cannot be expected to act, as the employer would. It is not possible for groups of men, organized in a foreign country for the purpose of getting money, to have the same interest in the workman of Massachusetts as his employer has. When the compensation law became effective four years ago, a considerable number of surgeons, who were engaged in a movement to elevate the standard of surgery, were apparently hopeful that the centralized power, lodged in the hands of the insurance companies, would be used in a way to aid their movement. That this hope has proved elusive is evident. What is the evidence?

1. Not a single hospital in the state has been built and equipped by an insurance company. The movement for plant hospitals and plant nurses was being developed when the law was passed, and it would be difficult to prove that this movement has developed faster than it would have done had there been no law; and I think it a reasonable conclusion that in many

instances the employer gladly turned the whole matter over to the insurance companies, to the detriment of the employee, when under former conditions he would have felt compelled to follow with interest the development of industrial hygiene. I wish my command of the English language was better, that I might make this distinction between employer and insurance company distinct and not to be forgotten, for I conceive it to be a vital part of the problem. Allow me to cite illustrations of this and the different attitude of the employer and insurance company. One of the corporations in Lawrence employing 6000 to 7000 people, had for years paid about \$4000 to six or seven physicians in its neighborhood for caring for its injured employees. They paid competent men a fair fee to care for the employee until that employee was able to return to work. When the matter fell into the hands of an insurance company, they contracted with a young man, whose need apparently was extreme, to do all of this work for \$900. This contract existed two or more years, to the dissatisfaction of the employees, to the physician himself, who said he could not afford to do the work for \$900, and, I understand, to the management of the industry also.

Another corporation, with 5000 employees, formerly sent its poorer-paid, help to the out-patient department of the hospital, but never refused to pay reasonable bills for those who did not go to the hospital; and its better paid employees were usually cared for by competent men as private patients during all of the period of disability. The insurance company now sends all the employees to the out-patient department. At least 20,000 of the 35,000 or more employees in Lawrence are sent to the out-patient department of the hospital, and the insurance companies are generally refusing to pay the family physician for caring for the few who refuse to go to the hospital.

This difference in attitude by employers and insurance companies toward the medical problem in the act was well illustrated in Newburyport. When the condition became understood in 1912, the Newburyport Medical Club asked the employers of labor if they believed it right for their employees to choose their own medical attendant. Ninety per cent. replied that they did, and agreed not to insure in a company which would not accord that freedom of choice.

It is urged by those who profit by the present law that it is necessary to lodge the power over the bodies and wills of the workmen in the insurance company, to protect the workmen against maltreatment and the insurance companies from extortion. If all our citizens were as loyal to common-sense medicine as is the group covered by this act there would be no necessity to protect the public from Occidental cults or Chinese herb doctors. The question is more concrete than that, however. I believe there are those here, conversant with the situa-



tion in some of the industrial communities, who will readily agree that many of the selections made by the insurance companies have been deplorable, and the ill results are much more widespread when one less competent man is hired to care for five thousand employees than if such a man gets only a small part of the work by competition. These citizens covered by the act have common sense and a desire to develop it, and it is very much more to the credit and profit of our country if all possible means are used to inform them of the best agencies of which they can avail themselves, than to compel them to be automatons in such important matters. No one desires the abolition of plant hospitals and nurses, and few, if any, believe the employee so lacking in sense to refuse to avail himself of really good service when offered without compulsion.

The framers of the act and the legislators who enacted it took full cognizance of the money-getting proclivities of the medical profession, and created a board with full power to pass upon the reasonableness of all charges. It has not been pointed out what more effective way could be devised. Through the interpretation of the law and the refusing to pay fees only to men hired by them, the control over this important matter has been grasped by private corporations and wholly removed from the hands of the State. It is not credible that the legislators understood what they were doing.

While the members of the profession are accused of being mercenary and commercial, all their suggestions that there is a civic principle involved is termed sentiment, and all the argument against an amendment met by the objection that it would cost more.

Whenever the insurance companies attempt to contract with a physician for services or to settle a bill, they talk "industrial rates." It is proper for us to examine for a minute the net results of their rates for services. The last report of the Commissioner of Insurance for the year ending June 30, 1916, states that the Rate-Making Bureau, composed of a representative of each of the companies and one from the State Department of Insurance, agreed upon 17½% as the rate of premium to be charged for writing compensation policies. This 17½% includes no office or any overhead expense. This same report gives the net premiums of the stock companies for the last year as, in round numbers, \$5,600,000; 17½% of this is \$980,000. Recalling that the removal of the employers' safeguard under the common law has practically compelled the employers to be insured, it is evident that this sum of \$980,000 has been absorbed by the stock companies in getting the business away from each other. The total benefits paid under the law was \$3,500,000. The experience of the year before (figures for this year not yet compiled) was 22% of total benefit absorbed in medical attendance, including hospitals and all

supplies. Accepting this figure as approximately correct for last year, it would produce \$770,000 paid for all forms of medical attendance,—\$210,000 less than was paid as agents' profits.

While the Accident Board and its Advisory Committee was trying to straighten out the tangle of unpaid bills four years ago, a member of the Accident Board facetiously remarked that "This is not a doctor's bill." This the doctors readily admit, and they now have an idea whose bill it really is. Mention of the Advisory Committee of physicians who aided the Accident Board during the first turbulent months, recalls the debt the profession owes to these Fellows of the Homeopathic and Massachusetts Medical Societies, for the hard, trying work which they performed. While all may not have agreed that palliative treatment was the one indicated, there was no doubt of the great relief their work afforded the suffering profession.

Proponents of present conditions also say, "A broad view should be taken of the matter"—that we should think only of John Smith's cut finger. It is very possible John's cut finger has been magnified by surgical inclination and other reasons, until it obscures altogether more of the field of vision than it would in its natural size. It is said sentiment should not be admitted as a factor in the problem. May I tell you a story,—a true story of the working of this act,—in which it is shown to strike at one of the most important sentiments which we all possess? The younger brother of one of the physicians of Lawrence had a finger injured while employed in one of the mills. When he reported the injury to the boss, he was told to go to the out-patient department of the hospital for treatment. The young man objected, saying he did not want to go to the out-patient department anyway, and did wish to go to his brother. He was told to go to the out-patient department or go to the office and get his time, which meant his discharge. Confronted with the dilemma of losing his job or going to the out-patient department, he went to the clinic—and his brother who happened to be on duty, treated him. Money consideration did not enter into this transaction; it was the sentiment which impels every man to enforce, if possible, the right to his own body.

If the workmen and the physicians in the industrial communities believe some of the medical provisions of the Compensation Act to be wrong, I submit that they will be guilty of a lack of civic spirit and of cowardice; if they do not attempt to register that belief in the most effective manner possible.

The commercializing of the profession has been a frequent topic of discussion at all times. It is so true as to be hardly questioned that nothing has occurred to commercialize the profession as the application of this law. Section of the Code of Ethics of the State Society con-



tains the following paragraph: "Physicians should take no steps with a view, directly or indirectly, to direct to themselves the patients or practice of others." If the State Society is to accept the present conditions, in which members contract to have the patients of their confrères sent to their offices under duress, it would seem only consistent with common honesty officially to expunge the code of this statement.

#### HEALTH INSURANCE.

A euphonious title chosen for its psychological effect. The underlying idea of the medical provision is stated to be: first, preventive medicine; second, the caring for the ill more effectively; and, third, at less expense.

It is stated that a contribution by the employer will incite him to consider ways of preventing illness. This is probably true if the trouble of doing this does not seem more expensive than the illness. It is a safe guess that at the first meeting of the Board of Directors after organization is perfected, and the medical phase of the act is to be provided for, the question before the house will be how doctors be procured cheapest. For a long time this will be the point at which economy methods will be applied. The beginning of efficiency methods, cost methods, at this point will have a positively unfavorable effect upon both of the more important factors. A limitation of the number of men employed, to the point of least expense, will render attention to preventive medicine unlikely. The most desirable physicians will refuse to have anything to do with it, if there is a small panel, and the gulf between the quality of medical services the well-to-do and the poor receive will be apparent as never before. Good medical service cannot be bought cheap any more than good service of other kinds. It is my belief that a further reduction of the income of the physicians in the industrial centres will certainly reduce the efficiency of the service. A reduction of fee for amount of work done will fall heaviest on those men who observe more carefully the admonition of the ethics of our profession. Let me reiterate. It is not fear for the financial welfare of any group of men that gives rise to this anxiety about fees, but a desire that fees should remain at least at a point which will insure the public good medical service. There is also a civic side to this matter and that is, the value to any community with a representative form of government of an independent body of intelligent men.

The report of the committee of the American Medical Association is so exhaustive and suggestive there seems nothing more to desire but a knowledge of just how such laws work in England in time of peace and how adaptable they are to the needs of a real republic. What will the country gain and what will it lose? As with all new things, it is incumbent upon this

proposed innovation to demonstrate its value in theory, and in practice where it has been tried. It is well that new methods should be thus examined for they often are intended to displace methods evolved by civilization at much cost. It is the duty of the profession to exercise that first law of nature, self-preservation, so far as to attempt to shape the medical details of legislation that the profession's usefulness may not be curtailed.

#### WORKINGMEN'S COMPENSATION FOR ACCIDENT AND SICKNESS, FROM THE POINT OF VIEW OF ORGANIZED LABOR.\*

BY JOHN P. MEADE, BROCKTON, MASS.,

*Chairman, Legislative Committee, Massachusetts State Branch, American Federation of Labor.*

THE Workingmen's Compensation Act of Massachusetts has now passed the experimental stage. Each fundamental provision of this important legislation has been tried for more than four years in the field of actual experience. We are just beginning to realize its value, not only to the individual worker, but, what is even more important, to the homes of the Commonwealth. Through its application in very many instances, dependents of the victims of industrial injury have been saved from becoming charges upon the public, and spared from the effects of destitution and want. We have here in the operation of this law the foremost social improvement of our time.

In the light of past experience, what can be done to relieve the worker in our mills and factories who suffer the pain and torture of industrial accident? This problem is just as acute and vital as it ever was, and its only answer is that the highest form of medical service and the best kind of surgical treatment should be placed at the disposal of the injured workman. Any effort or attempt to cheapen this treatment and service will meet with the most emphatic protest by the working people of our State. The worker who engages in the hazardous occupations, whose life is jeopardized daily in the interest of society, should not be sacrificed on the altar of selfishness and greed. His right to adequate care and assistance to recover at the earliest possible moment from the effects of accident should be freely recognized. This right should not be denied him by any attempt to contract medical treatment out to the lowest bidder. There are, among others, two important principles of the Compensation Act that must concern the medical profession, as represented by the Suffolk District Medical Society.

\* A compilation of articles published in the *Medical Society Bulletin*, October, 1914.



I refer to the sections of the act that pertain to the medical adviser of the Board, and the duty of impartial physicians.

How important the duty of medical adviser is! His judgment must be as accurate as the human mind can make it. He must be absolutely above any selfish consideration. His opinion in the final analysis, in the very difficult cases which deal with the medical problems arising therein, is of tremendous importance to the welfare of the working people and the correct administration of the act. What labor asks in such an official is justice. We do not want, neither do we seek, that which does not belong to us. We have no complaint in this respect now. Indeed, the courage and ability of the present medical adviser is so well known throughout the State, that the layman at least points to this fact with the strong conviction that it has resulted in building up confidence among the laboring people in the administration of the compensation law.

The work of the impartial physician is of great importance in the proper operation of the act. His written opinion is now admissible as evidence before arbitration committees in case of controversy. The impartial physician should be selected with great care. His credentials for this duty should be marked by experience and the highest ability.

In many instances a knowledge of the conditions under which the workman recovering from an injury is to be employed should constitute the basis for a liberal prognosis. Especially is this true in cases of amputated phalanges among workmen in the shoe industry who are engaged in cutting sole leather. Men employed in this occupation handle a large die, and frequently must use the injured digit to guide its operation. Unless these considerations are given their adequate value in the determination of when the workman injured in such employment is restored to his normal working capacity, an injustice is sure to be inflicted upon him. Such instances are prolific sources of disagreement between the insurer and the victim of industrial accident, and forces the workman to establish his rights through arbitration proceedings.

To my mind, every physician should become familiar with the general principles of the act. Every doctor should at least be qualified to advise those who suffer from injuries arising out of and in the course of their employment, as to their rights under the Workingmen's Compensation Act. If such a course were followed, the justice of claims, now so frequently in dispute, could more easily be established. Nearly 800,000 workmen are now within the scope of the Massachusetts act, and are vitally concerned with its administration. The Massachusetts Branch of the American Federation of Labor, representing the organized workmen of this Commonwealth, at its recent convention in Spring-

field, devoted nearly two days to discussing various phases of the compensation law, and the relation of injured workmen thereto.

That insurers should provide the injured worker with medical treatment during the entire period of incapacity, and that the victim of industrial accident should be given the right of choosing his own physician, were declarations which met with unanimous approval by this gathering.

Touching, as it does, the medical profession through many different points of contact, it seems to me quite appropriate to urge greater interest in the greatest piece of social legislation of modern times.

This work would be of most practical value, and although I am aware that no group of professional men in the community give freely of their talent and skill more than do the physicians, yet an intelligent interest by the medical profession in the operation of the act could only result in its more efficient administration.

#### THE ADMINISTRATION OF THE WORKINGMEN'S COMPENSATION ACT BY THE CITY OF CAMBRIDGE, MASSACHUSETTS.\*

BY HERBERT J. CRONIN, M.D., CAMBRIDGE, MASS.

THE city of Cambridge at the city election on March 10, 1914, accepted the provisions of the Workingmen's Compensation Act<sup>1</sup> for its laborers, workmen, and mechanics as allowed by Chapter 807 of the Acts of 1913 for Massachusetts. This act<sup>2</sup> grants the same compensation provided by the general compensation act to certain public employees only—the laborers, workmen, and mechanics. The clerical force, firemen, policemen, superintendents, and city officials are not included under its provisions; if injured, they still have their rights to sue at common law.

A city either may operate its own insurance under the jurisdiction and supervision of the Industrial Accident Board, just as the regular insurance companies, or it may give the insurance to a private insurance company. The city of Cambridge chose to operate its own insurance.

#### INSURANCE DEPARTMENT OF THE CITY OF CAMBRIDGE.

The chief of the administrative department of the workmen's compensation insurance for the city is the mayor. He has designated his secretary to act as the agent prescribed by law.<sup>3</sup> This agent is held responsible by the Industrial

\* Read before the Middlesex South District Medical Society, October 11, 1916.



Accident Board for the proper administration of the act. He must investigate claims, furnish the benefits due, and advise the Board of all agreements or settlements made. The agent's office is an appointive position by the mayor, not subject to the confirmation of the council. The salary is \$500 a year. Legal questions are referred by the agent to the city solicitor, who is paid a yearly salary to administer all the legal affairs of the city. Thus far but few compensation problems have been referred to the solicitor.

The medical department is in charge of a physician appointed by the mayor without the confirmation of the council, and requested by him to furnish the medical services required by law<sup>4</sup> to the injured employees. The compensation physician is paid by the case, and the same fee is charged as in the treatment of a similar type case in private practice. The mayor demands that the best medical service obtainable be given to the employees, and urges that every medical aid which will decrease the suffering or shorten the incapacity of the injured men be employed. Rather than merely to follow the prescribed provisions of the law, he suggests that the broad, humanitarian principles, which animated the creators of the act, be cultivated in its administration in Cambridge.

#### DISPOSAL OF CLAIMS BEFORE THE ACT.

Before the acceptance of the provisions of the Workmen's Compensation Act, the method of adjusting claims of injured employees was inadequate and unfair. Men injured in the service of the city and desiring compensation were compelled to place a petition before the Committee on Claims of the City Government, begging for a continuance of pay. This committee would consider the claim, would have a hearing, and could, with the approval of the mayor, award the continuance of pay during the man's incapacity. The men had no definite rights. If it could be proved that the man was negligent, that the neglect of a fellow employee caused the accident, or if it was presumed that the employee assumed the risk of working in a dangerous place, consideration of the claim might be refused. Sympathy might persuade or influence the committee to award claims, regardless of the true conditions in the case. Now all claims for injury must be settled on an equal basis, determined by law.

#### PRESENT METHOD OF PAYING COMPENSATION.

An injured employee is entitled under the Workmen's Compensation Act to full medical service for the first two weeks, but no wages. At the end of that period, he receives two-thirds of his weekly wages, but not more than ten nor less than four dollars a week for the period of his incapacity. Compensation on the above basis, for 500 weeks, but not more than \$1000, is paid

for total incapacity or death. Every laborer, workman, or mechanic, in the employ of the city is eligible to the benefits, unless it is proved that the injury was received by reason of serious or wilful misconduct.<sup>5</sup>

The money for compensation is paid out of the payroll of the department in which the man is employed. There is no general appropriation in the yearly budget for the purposes of workmen's compensation. When there are definite appropriations in the budget for specified work, claims for compensation for injuries received on the work are paid out of that particular money. Because of the many hazardous occupations, the street, sewer, and water departments have suffered most heavily from compensation claims.

The death claims are paid in weekly installments to the dependents, from the department's payroll in which the employee worked. Although the law allows a lump sum settlement<sup>6</sup> to the dependents in certain cases after six months, there has been no departure from the weekly payments. Such payments would be difficult in this city because they would drain the appropriations of the department in which they occurred, and might embarrass its operations for that year. Provisions for such claims would have to be made in the budget at the beginning of the year.

#### AN INSURANCE FUND FOR WORKMEN'S COMPENSATION PURPOSES.

A special fund in the city might be created to cover claims for compensation. At present a few departments pay most of the compensation. To equalize conditions, every department could contribute a small yearly premium into a reserve fund devoted to compensation purposes. The premium could be regulated by the number of employees insured and the hazards of the department. As the fund would increase in size yearly, it would soon form a strong reserve fund. Then, in case of a serious accident, resulting in death or long periods of incapacity, the compensation could be paid out of that fund without interfering with the operations of the department. Immediate settlement of all claims would be assured, and a substantial lump sum payment could be allowed the dependents.

The objections to such a fund are that the city has a general reserve fund; that departments which have no accidents would be assessed for those that did; and that the city is always able to borrow money. Yet the present system is not satisfactory. There are too many opportunities for error when each department settles its own claims.

To improve these conditions, there should be taken from the tax levy an adequate sum sufficient for a year, for workmen's compensation purposes, and all compensation claims drawn on this sum by the agent for workmen's compensation alone. This would centralize the finances



of the act and prevent a possible duplication of payments that might arise where each department pays its own claims.

#### STATISTICS.

One hundred and thirty accidents, including two deaths, were reported from March 10, 1914, to Sept. 1, 1916. Thirty-three cases have applied for compensation and have been paid a total of \$3779.23. Out of 97 cases, no time was lost at all in 52, while the remaining 45 returned to work within the two-weeks' limit. There were 2366 days lost. The medical expenses were \$532. Approximately 600 men were included within the provisions of the act during each year.

#### QUESTION OF INSURING IN A PRIVATE INSURANCE COMPANY.

The principle of insurance is,—to pay the losses of any one subscriber from the combined premiums of the whole. If the city insured in a private insurance company, it would pay a definite yearly premium to the company to operate its insurance. A serious accident, with heavy losses, that now must be borne by the city alone, would then be paid by the company out of its combined premiums. To insure in one of the stock companies, the premium, based on a payroll of approximately \$500,000, would cost the city \$10,000 per year.

Few companies will accept city business because the large risks makes it unprofitable. The underwriting is difficult as the exact definition of the terms, "laborers, workmen, and mechanics," has not as yet been determined. If a court decree should include within the provisions of the act a class of employees that were not calculated on in the premium, the company might suffer heavy losses.

A mutual insurance company formed by all the municipalities insured by the act might be created. The chief administrative officers of the municipalities could direct the company. This company might be able to give a more equitable rate than the stock companies that now handle this business. If it were not desired to start an entirely new company, the Massachusetts Employees' Insurance Association, a mutual company of employers originally created by the Massachusetts Legislature to handle all the workmen's compensation business in this state, might be authorized by law to create a special department for the administration on a mutual basis of municipality insurance. Small municipalities, on whom large losses would be a heavy burden, would greatly benefit from association in a mutual insurance company, particularly if it were under state control.

The objections to insuring Cambridge in a private company, especially in a stock company operated for a profit, are many. The city is a \$130,000,000 corporation, with a complete or-

ganization that can be used for insurance purposes without extra expense or the expenditures for administrative purposes demanded by the private companies. No profit is derived from the insurance by the city,—practically the entire payment is given to the man for compensation. The administrative expenses for the city are the salary of the agent and the fees of the physician. If special care is taken to prevent accidents, and only employees in good physical condition are chosen, the city can continue to operate profitably its own insurance. Already some of the large business corporations run their own insurance, especially when they have made a physical examination of all their employees and divided them into liability groups, according to their physical condition.

#### PHYSICAL EXAMINATION OF EMPLOYEES.

A physical examination of all the city employees covered by the act might be feasible, when they are hired, and periodically afterwards. Physical defects would be discovered and the men could be placed at work suitable to their physical condition. The city would be protected from false claims for injuries alleged to have occurred during employment, but which in reality were chronic diseases. A record of serious physical defects, such as hernia, joint trouble, syphilis, varicose veins, or any of the common chronic conditions could be compiled, and would be of service in adjusting claims.

When the large liabilities that the city assumes in operating its own insurance are measured, the necessity for a knowledge of the employees' physical condition is obvious. There are no provisions in the act for the relation of physical defects to injuries. A recent Supreme Court decree states that in the act "there is nothing said about the protection being confined to healthy employees. This act makes no distinction between the wise and foolish, skilled or inexperienced, healthy or diseased employees. It is the injury arising out of the employment and not out of the disease of the employee, for which compensation is to be made."<sup>18</sup>

To allege that an injury arose out of the employment and was not a long-standing condition is not difficult. If it can be shown that a pre-existing organic condition was accelerated or aggravated by an injury, compensation is allowed. In practice, such chronic conditions might have been activated by natural causes; yet, when injury is alleged, it is difficult and expensive to prove that it is not the injury, but the physical condition, which caused the disability. Syphilis, in any of its forms, is a hazardous disease, because of the long period of incapacity that can accompany it.

Men in poor physical condition are often employed by the city, and are protected by the Civil Service regulations, so long as they remain on good behavior. A city is expected to harbor its unfortunates and not be too rigorous in its



demands for a full service return from its labor. With the acceptance of the Workmen's Compensation Act, it is questionable if this policy can be longer followed. Every employee now becomes a potential hazard. Large sums of money can be lost and debts shouldered on the city for years to come by compensation claims. Men who are physically unable to perform the city work, and have a recurrence of organic disease, must be paid the same compensation as those receiving legitimate injuries. Only a physical examination of the men will protect both the men and the city. Later the Legislature may enact special rates and conditions for those suffering from chronic disease and liable to become financial burdens on the insurance. The framers of this act never intended it to become a pension for weaklings or those who were physically unfit prior to employment. For the present, reliance must be placed entirely on accident prevention, to keep the compensation claims within reasonable limits.

#### PREVENTION OF ACCIDENTS.

Pain and suffering will be lessened for the man, and the city will be saved financial losses by the prevention of accidents. Part of the premium of all insurance companies is spent for accident prevention and safety inspectors.

The city has recently started a campaign for the prevention of its accidents. Every foreman is urged to act as a safety inspector in his department. The formation of a safety committee according to this tentative plan is under way. A general committee, to consist of all the foremen, will inspect dangerous places, make recommendations for guards on machinery, and draw up safety regulations; an administrative committee of the superintendents and the city engineer will order the suggestions carried out.

#### CONSIDERATION OF THE TWO DEATHS.

A street department employee was thrown into the machinery of his sweeper and killed, when it was struck by an automobile. The sweeper was operated by chains and gears that might have been enclosed.

A water department employee in 1915 was struck by a train and killed. He was urinating under a railroad bridge instead of using the station toilet. This dangerous practice should have been prohibited by the foreman.

These two deaths cost the city \$4000 each, while the families lost one of their members.

#### WHAT CITY EMPLOYEES ARE INSURED UNDER THE ACT?

There is as yet no classification in the city determining exactly the employees insured by the act. The law merely specifies laborers, workmen, and mechanics, without defining the types of employment to be included within these terms. Neither has the Industrial Accident

Board defined the limits of these terms. Practically, the board has determined that employees who work with their hands and not with their brains are the classes to which the legislature intended to give the benefits of the act. The office forces, school teachers and city officials are considered brain workers; the street, water, park and sewer employees are termed manual laborers. Questionable cases must be referred to the board for judgment, and the board will decide by considering the exact nature of the work at which the man was employed at the time of the accident. Important rulings will probably be referred to the Supreme Court for final decision.

The terms "laborer, workman and mechanic" have partly been defined by a recent decision of the Supreme Court which reads in part, "A 'laborer' ordinarily is a person without particular training who is employed at manual labor under a contract terminable at will, while 'workmen' and 'mechanics' broadly embrace those who are skilled users of tools." The Civil Service classification has partly assisted in defining these terms. Although their classification is for Civil Service purposes only, the commission has tried to include in the Labor Service only such men as work with their hands all the time.

City firemen and, by virtue of the same decision, city policemen, have been excluded from the provisions of the act by a recent Supreme Court decision in the Devney case.<sup>10</sup> Mr. Devney, a Boston fireman, was killed in the engine house where he was stationed by falling down the pole-hole. It was thought that the young man had a nightmare, imagined that an alarm had rung, walked to the pole and fell to the floor below. The Industrial Accident Board decided in favor of the dependents, but the Supreme Court reversed the decision. The court decided that the Civil Service rules "classified a fireman, employed by the city, in the 'official service' and not in the 'labor service,' which is divided into 'laborers,' 'skilled laborers,' 'mechanics and craftsmen.'" A discussion of the case develops that firemen take examinations to be appointed, wear uniforms, and are considered to be public officials charged with the performance of certain public duty or service. They have always been recognized as a distinct class, and if the Legislature had intended them to be included within the provisions of the act, it would have been plainly so stated.

#### PENSIONS AND VACATIONS.

The city allows two weeks vacation with pay each year to every laborer. This vacation has been taken advantage of in connection with the administration of the compensation act by the city. When a man is injured, he is immediately given his vacation on his request. This assures him of his regular weekly income during the first two weeks after the accident, while the law merely gives free medical attention.



Under the state law,<sup>11</sup> city employees are granted a pension after a certain term of service. The older employees who receive small injuries are urged to take advantage of this pension. When injured they may accept either compensation or pension, but not both.<sup>12</sup>

#### SPECIAL POSITIONS FOR INJURED MEN.

The superintendents are requested to hold certain positions open for the men who have not wholly recovered from the effects of their accidents, but have returned to work. Such positions are, driving a team, acting as watchman, or other work of a light nature. This enables the man to earn his full wages and saves the city compensation.

To return men to work at the earliest possible time is the policy of the medical department. Effort is made, not only to institute a medical cure, but to restore function so that the man may resume his former work quickly. A fractured leg may be in good position and strongly united, but if the knee joint is stiff and the muscles atrophied, the man will still be incapacitated from work, although he is medically cured. Measures to restore function should be coupled with medical treatment.

#### SATISFIED WITH THE LAW.

The employees are well satisfied with the operation of the law. They now have definite rights and are no longer subservient to others for an adjustment of their claims. Each year the benefits of the act are increased by the Legislature.

#### REFERENCES.

- <sup>1</sup> Mass. Acts of 1911, Chapter 751, and acts in amendment.
- <sup>2</sup> Mass. Acts of 1913, Chapter 807.
- <sup>3</sup> Mass. Acts of 1915, Chapter 244.
- <sup>4</sup> Mass. Acts of 1911, Chapter 751, Part II, Section 5.
- <sup>5</sup> Mass. Acts of 1911, Chapter 751, Part II, Section 2.
- <sup>6</sup> Mass. Acts of 1911, Chapter 751, Part II, Section 22.
- <sup>7</sup> Mass. Acts of 1911, Chapter 751, Part IV, Sections 1-24.
- <sup>8</sup> Madden's case, 222 Mass. 487.
- <sup>9</sup> Devney's case, 223 Mass. 270.
- <sup>10</sup> Idem.
- <sup>11</sup> Mass. Acts of 1912, Chapter 508.
- <sup>12</sup> Mass. Acts of 1913, Chapter 807, Section 5.

The death cases are being settled on a basis of \$10.00 a week for 400 weeks till a total of \$4000 has been paid to the dependents.

TABLE 11.  
TIME LOST.

DATE	TIME LOST IN DAYS	NUMBER OF CASES IN WHICH NO TIME WAS LOST	PERCENTAGE OF CASES RETURNING WITHIN 2 WEEKS AND RECEIVING NO COMPENSATION
Mar. 10, 1914 to Jan. 1, 1915	382	5	40%
Jan. 1, 1915 to Jan. 1, 1916	1630	26	76%
Jan. 1, 1916 to Sept. 1, 1916	354	21	80%
TOTAL	2366	52	65% aver.

The decrease in time lost in days and the increase in the number of cases that have lost little or no time has resulted from the policy of giving the employee light work until able to resume his former activities. The measures taken to restore a man's functions, as well as to perfect a medical cure, have also aided in reducing the time lost.

TABLE 111.  
MEDICAL EXPENSES.

DATE	MEDICAL EXPENSES
Mar. 10, 1914 to Jan. 1, 1915	\$24.00
Jan. 1, 1915 to Jan. 1, 1916	\$206.00
Jan. 1, 1916 to Sept. 1, 1916	\$302.00
TOTAL	\$532.00

TABLE I.

#### COMPENSATION PAID

DATE	REPORTED ACCIDENTS	NUMBER OF CASES PAID COMPENSATION	AMOUNTS OF COMPENSATION PAID
Mar. 10, 1914 to Jan. 1, 1915	14 non-fatal 1 fatal 15	9	\$453.23 to non-fatal cases. 75.00 to one fatal case. \$528.23
Jan. 1, 1915 to Jan. 1, 1916	67 non-fatal 1 fatal 68	17	\$1429.57 to non-fatal cases. 930.00 to two fatal cases. \$2359.57
Jan. 1, 1916 to Sept. 1, 1916	47 non-fatal 0 fatal 47	7	\$191.48 to non-fatal cases. 700.00 to two fatal cases. \$891.48
TOTALS	130	33	\$3779.28



TABLE IV.  
EXPENSE TO INSURE CAMBRIDGE IN A STOCK INSURANCE COMPANY.

GENERAL CLASSIFICATION	PAY ROLL FOR RATE PER \$100 A YEAR	ON PAY-ROLL	PREMIUM
Janitors,—schools, libraries, municipal buildings . . .	\$2,466	0.97	\$ 606
Erection of polling booths . . . . .	1,304	1.75	24
Engineers, firemen, elevator-men . . . . .	9,069	0.97	88
Ambulance drivers . . . . .	8,750	1.21	106
Matrons . . . . .	929	0.97	9
Electrical work, general . . . . .	5,459	1.44	79
Electrical work, linemen . . . . .	10,017	3.05	306
Forestry, spraying and pruning of trees . . . . .	13,307	4.59	611
Hospital and City Home employees other than clerks and nursing staff . . . . .	6,485	0.53	39
Sewer construction . . . . .	10,088	4.59	463
Ashes and garbage collection . . . . .	107,510	1.58	1,699
Street cleaning . . . . .	59,745	3.49	2,086
Street building and maintenance . . . . .	57,550	2.31	1,329
Sidewalk construction . . . . .	5,493	1.10	77
Street watering . . . . .	16,391	1.58	259
Bridge labor . . . . .	456	2.31	11
Draw tenders . . . . .	21,405	2.91	491
Park, cemeteries and reservoir surroundings main- tenance . . . . .	63,062	1.21	743
Water works operation—pumping station . . . . .	10,402	0.83	86
Water mains construction and repair . . . . .	45,981	2.90	1,234
Reservoir keepers . . . . .	2,092	0.97	26
TOTAL . . . . .	\$518,574		\$10,342

The medical expenses have been unusually small for the work. Many cases were found to have had no bill; the patient himself probably paid the medical expense.

In this classification of employees, only those who are probably included within the terms "laborers, workmen, and mechanics" were considered.

The pay-roll figures were taken from the list of department expenditures for 1915-1916, printed in the proposed budget for 1916-1917. Where they were incomplete, recourse was had to the annual report for 1915.

The probable premium rate was taken from the stock companies' manual of rates. An expert underwriter checked them up.

up in this proposed legislation which is, in effect, an extension of the principle involved in the former legislation. We can learn something by studying what has been done in other countries. In this communication I shall endeavor to be brief and to touch upon simply salient points. From other countries we may learn that voluntary insurance has, in almost every instance, proved a complete failure; also that the evil results of medical attention paid on the capitation plan have been everywhere evidenced much as they are today in lodge practice. We may also learn one great fact from the history in England where, after the physicians had protested the terms of the proposed act through their organized body, the British Medical Association, and had agreed with practical unanimity not to work under the act,—on the day after the act was passed 10,000 physicians applied for positions, and, within a week, 15,000, causing the British Association to acknowledge that it had been defeated, and to release its members from the pledges previously given.

The statistics of charitable organizations show that about 33 1/3% of the cases of dependency in the Commonwealth are due to sickness, and about 26% to non-employment. If non-employment could be insured against, and if sickness could be lessened by preventive measures, and the time of disability due to sickness diminished by the best possible treatment, then the economic advantage to the Commonwealth would be great. This implies that in any proposed scheme boards of health must be included that prophylaxis must be emphasized, and that the quality of medical service must be of the best; that serious cases must be placed in the hands of experienced physicians; and that in the scheme must be included the attention of

## INDUSTRIAL HEALTH LEGISLATION.

By FRANCIS W. ANTHONY, M.D., HAVERHILL, MASS.,

*Member of the Medical Committee Advisory to the  
Industrial Accident Board  
President, Massachusetts Society of Examining  
Physicians.*

THE question of legislation which is contemplated in regard to industrial health insurance is of great importance to the physicians of the Commonwealth. It is particularly important that before any legislation is enacted, physicians acquaint themselves with what is proposed, and fully realize what an act of this sort may mean to the profession. The complicated questions that arose at the time of the Workingmen's Compensation Act are mere trifles as compared with the many-sided problems that come



specialists and the employment of hospitals whose work conforms to an established standard. It also implies that there must be a certain standardization of physicians. It is true that all men practising medicine in the state of Massachusetts have been licensed by the Board of Registration, but not only is it true that scarcely a man in the State is competent to practise medicine if we include in that term treatment in all its specialties, but also it must necessarily be true that there is every degree of competency in the profession. Few general practitioners are willing to operate upon an injured eye, and the number of men in a given community who are competent to do an intestinal anastomosis is small. In the practice of today it is the custom of the great majority of the physicians of the State, competent as they doubtless are to diagnose and treat the ordinary ailments of their patients, to call to their assistance men whose opportunities have been greater in diagnosis, or those who have laboratory facilities impossible for the ordinary physician, or to call those specially trained and experienced in surgery, neurology or this or that special branch of medical work.

Any plan, therefore, for utilizing services of the profession at large must include in it the recognition of the necessity for securing the services, either directly or as consultants, of the best trained men in the State.

From the practical working out of the Workmen's Compensation Act we can also learn a great deal. First, every profession, as Dr. Cotton has well said, contains a certain percent. of undesirables, and if, in the medical profession we estimate this number even as low as 5%, which is probably not far from the real truth, still no legislation can be framed that does not take into consideration this small percentage, and which is not framed so as to prevent them from becoming a menace to all with whom they are connected. A physician who for several weeks treats as a sprain a fracture of the thigh, one who regards as a malingeringer a patient suffering from a fracture dislocation of the vertebrae, one who presents a bill of \$20 for four office visits of a man suffering from a contusion of the thumb, one who, not surgically expert, enters into a contract to do work requiring good surgical judgment—any one of these men is not proper to render such service as a compensation act requires, whether he attempts to serve the injured party directly in the relation of physician and patient, or whether he expects employment from an insurance company that takes a narrow view of what is best, not only for the patient, but also for itself. Second, those who have been in close touch with the work throughout the State have learned that, quite a per cent. of those earning low wages in employment in Massachusetts, are not only *not* insistent upon the free choice of their physician, but really express little interest in the matter, provided that their bills are met. While it is

claimed that every workingman has the inalienable right to choose his own physician when sick or injured, it is as true that he has the inalienable right to elect whether he will employ a physician of his choice, or will accept service that is rendered him at no expense to himself. Third, we have also learned that there is quite a percentage of physicians who do not care to enter upon industrial work. Fourth, that there are plenty of physicians who will take the work in any form that it is offered. Fifth, that insurance companies of good standing prefer good work for financial reasons if no other. In other words, that there is the same difference between insurance companies that there is between individual physicians. Again to quote one of Dr. Cotton's terse statements, "Were all injured people honest, were all physicians honest, were all insurance companies honest, the problem would be simplicity itself." Sixth, with properly equipped plant hospitals much can be done at relatively low cost. Seventh, that any plant hospital or other hospital that does not bring the patient in *personal* touch with a physician of standing and qualifications is not valuable. Eighth, that some insurance companies will abide by a gentleman's agreement, while others seemingly will not. Ninth, that the best obtainable service is in the end the cheapest. Tenth, that there must be a following-up system during convalescence. Eleventh, that prevention avoids trouble.

If the proposed health legislation goes through in the form of a bill, the physicians of the State must not be caught, as they were at the time of the action relative to the compensation act, namely, in a state of soporific somnolency. The progress of the legislation must be carefully watched, and the members of the legislature must be impressed by the physicians who know them, with the fact that there are in this bill large medical questions involved. If such a bill passes it should not be so framed that the capitation plan of insurance is used. Personally, I believe it would be very disadvantageous, both to the workingman and to the physicians if the insurance was developed so that it was a State insurance. This would mean political appointments, and that means inferior service. The bill should be so framed that the medical services be paid for per visitation, but there must be with this a limitation to the charge. The most satisfactory measure yet devised, I believe to be that recommended by the medical committee advisory to the Accident Board as a basis for the compensation under that act, namely, the average minimum rate for the same kind of service rendered in the locality in which the accident (or sickness) occurs. When we remember that most of the medical services rendered families of those who earn under \$750 a year is *now* gratuitous, the minimum rate ought certainly to procure medical attention of the proper grade.



The bill should be framed so that, *at the start, every physician licensed to practise in the State, who desires to take up this line of work, should have the opportunity to register his name; but, to remove the incompetent and undesirable, a strong central board with deceptating power should be incorporated in the act. This board should have medical representation upon it.*

The number of patients or families to be treated by one physician should be limited: first, in order to avoid the consequences necessary to too much work, namely, poor service to the individual; and, second, as far as possible, to divide the work. It will always be true, as is now true in private practice, that some men will be more popular than others, either owing to real greater efficiency, or to their possession of those faculties or qualities that appeal to the popular taste. As in private practice, so in work of this nature, these assets of a given physician will be valuable to him as a direct benefit, and nothing can prevent their being such a benefit; the only direction to be undertaken is that they do not impose upon him an amount of work that he cannot properly handle.

There must be provision for specialists, for the masseuse, for the dentist and for apparatus. There must be medical referees, not local, to settle disputes. The charge for medical referees, hearings, etc., must not be debited to the medical expense, because it does not belong there, but is really a part of the administration of the act. The reports of medical referees must stand as evidence at hearings, otherwise the type of man required for a referee could often not be obtained, owing to the inability of a man of this grade to give up the time necessary to attend long-drawn-out hearings. Group work should be encouraged, provided that this group work conforms in its units and in its whole to a *definite standard*. It should not be possible to allow a group of men to join forces in work under this act unless some competent authority passed upon the question whether those taking up a special line of work had special training and ability along the line assumed. But, granting that a definite standard was established, the highest benefit must ensue to the workman if his case was passed upon by a group, each one of which had a special training. Arrangements must be made to cover the questions of changing doctors, this being permitted at the request of either the physician or the patient upon the approval of a referee.

I have written enough perhaps to call the attention of the profession to the broadness of the scope of the question involved in this act and of its vital importance to the profession as a whole. Some of the most important features are these: If this legislation is adopted, and goes through in the form of *State insurance*, it is the opinion of those who have carefully considered the matter that it means the ruination

of the practice of from 20 to 30% of the physicians now engaged in the Commonwealth, if there is included in it a plan by which those earning more than a minimum wage can share its benefits. If it goes through and is placed in the hands of insurance companies who are allowed to select an individual or an extremely limited panel, the effect upon the profession of the State will be practically the same. If it goes through and a panel is formed, wide open at first, but reduced rapidly and purged of the incompetent and undesirable, the best interests of the workmen, of the physician, and of the companies will be assured.

A committee of the Massachusetts Medical Society, consisting of Dr. Frederic J. Cotton of Boston, Dr. W. H. Merrill of Lawrence and myself, have been in touch with the recess committee of the Legislature, who are this summer and fall considering the question. They have received us always courteously, and listened with attention to what we have presented. I know that the other members of the committee feel, as I do, that our task is Herculean, and that we need the assistance, advice and friendly criticism of the profession at large. Our most difficult task has been to get the profession to realize that there is under consideration a measure which means so much to them, and that they should feel that the inception of a measure of this sort is the time to see that the rights of the profession are safeguarded. I believe that such legislation is coming within a few years, if not coming this year; that it will be advantageous to the poor, who at present earn a wage insufficient to allow them to pay for medical care, *provided* that the act is so framed that the workman receives the attention, not of the poorest members of the profession, not of inexperienced men learning the profession in large hospitals, but of the men best equipped for medical service. The man who, recognizing the future, is not now equipped to render satisfactory service, or who does not, in view of the future, well and thoroughly equip himself for such service, will, in the future, bitterly complain, but will not deserve sympathy. I sincerely hope that every physician will examine and carefully consider these questions, not from a narrow standpoint, but from the broad utilitarian standpoint, of what is best for the Commonwealth as a whole.

RECALL OF HEROIN.—Report from Washington on December 12 states that Dr. Rupert Blue, Surgeon General of the United States Public Health Service, in a circular order to all commissioned medical officers of the service, has ordered the dispensation of heroin and its sale at relief stations to be discontinued and all stock of the drug returned to headquarters.



## THE MEDICAL DEPARTMENT OF A MODERN INDUSTRIAL PLANT.

By F. O. WEST, M.D., WOBURN, MASS.

THE development of the medical department of a modern industry engaged in a dangerous trade (the manufacture of phenol, benzol and picric acid) shows recognition of its responsibility in providing adequate medical service to its men, and emphasizes its desire to comply with the spirit of the law, as well as the letter.

At the beginning, the department was conducted in a small pump house (Fig. 1). Treat-

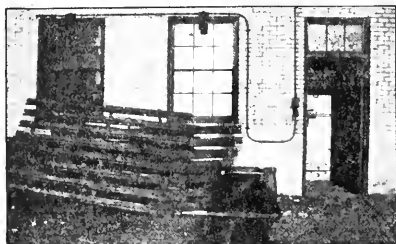


FIG. 1. ORIGINAL FIRST-AID ROOM.

ment was given by a member of the guard who was stationed at this part of the plant, and who had had some experience in first-aid work. He was still a member of the guard and did the other work simply as a side issue. The serious accidents were cared for by the first outside physician available, and in case of the need of hospital care, the injured man was transported over a rough road for three miles in a horse-drawn ambulance. The supplies of the department were merely those prescribed by law. No records were kept except in the serious accidents causing disability, and the system in this regard was uncertain and very unsatisfactory.

This situation soon became entirely inadequate, both as to housing and service. To improve conditions, the department was moved into a larger building, but in which the pump, to be used in case of fire, was also housed. The attendant was still a member of the guard, but was detailed to do nothing but this work, and he was assisted by another man, who took care of the night shift. More supplies were added, but the clerical work was still done by a member of the office clerical staff when he had any leisure time.

Finally, under the direction of Dr. W. F. Boos, of Boston, the consulting physician of the plant, the next and final development took place, and on March 1, a fully equipped hospital was built and put in operation. (See Fig. 2.) This is a sheet-iron building erected as a hospital and used solely for medical purposes.

It consists of: a four-bed ward, in which is also kept, because of lack of room elsewhere, the operating table and instrument cabinet; a room for the first-aid, possessing all the supplies and



FIG. 2. PRESENT HOSPITAL BUILDING.

equipment of the out-patient surgical room of our largest hospitals; with the addition of two lung motors; a pharmacy for the medical and surgical supplies, with facilities for making and compounding any preparations that might be needed; together with an ice box and an electric range; a bathroom containing a full-length tub, and a shower bath; in this room there is also a high-pressure steam sterilizer; the resident surgeon has an office with scales, clerk's desk and filing cabinets; and a small laboratory which is equipped with all reagents for ordinary work, a microscope and a water-power centrifuge. The seventh room is set aside as a living room for one of the first-aid men. On the west end of the building is a piazza and a fumigator for fumigating mattresses. A large electric fan gives ventilation. There are linoleum floors in three rooms, the others have hard wood.

The personnel of the medical staff was also enlarged. On February 1, the writer was appointed resident surgeon, and devotes part of the day to the plant, and is on call for accidents. The first-aid force became separated from the guard and was increased to three men, one of whom was a pharmacist. With one man sleeping in the hospital during the night, we have a service with two men available at all times. To handle properly the vastly increased clerical work, our department has a clerk who devotes his entire time to the work made necessary by the many reports required, and by our complete system of case records.

In addition to this well-equipped hospital that is able to handle, for a time at least, the most serious accidents, and keep for any length of time accidents that do not require expert nursing, we have established emergency stations in all the buildings, which have reagents suited to their peculiar needs. These racks are inspected daily by a member of the hospital department, and all reagents kept supplied. On the daily rounds of the plant this man comes in constant touch with the workers, and is able by constant



reiteration to educate them in their personal care.

The first-aid racks are intended simply to relieve at the time of accident; further treatment is carried on at the hospital. Employees are instructed to report immediately after the accident, and not to let even the slightest scratch go untreated. To our vigorous campaign, we feel confident the absence of infected wounds can be attributed. Of the 1648 accidents treated from March 1 to October 1, we have not had a single infected wound when the man reported at the time of accident, and only two infected wounds due to failure to report till infection set in. One of these was a septic hand, occasioned by an employee attempting to remove a splinter from his palm with a dirty tobacco knife; three days later he reported for the first time with a palmar abscess. The other case was a septic finger; infection entered through a small abrasion, which was neglected; this man also failed to report till his finger became swollen and painful.

In cases where it seems inadvisable for the injured to return to his home, either because he needs observation as a result of "fume" poisoning, or because rest is needed, the patient is put to bed in our ward and is kept as long as required. As before mentioned, in cases of grave nature demanding expert nursing, the patient is transferred to a hospital. If a man demands to be sent home and requires farther treatment, he is cared for there. An x-ray apparatus, the property of the resident surgeon, is available when needed, and all fractures and doubtful cases are so examined.

All accidents are carefully tabulated, giving the total number, character of injuring agent, location of injury, and department where the injured man is employed. Not only do we have accidents peculiar to our line of industry, but we have many common accidents that will occur about a large plant, from scratches to wounds requiring many stitches, and from contusions to fractures. Moreover, we have not confined our services to accidents alone, but have also included any medical ailment that the man may present. We have a list of 41 different complaints of a medical nature, that the men have called on us for; this list including such as hemorrhoids, headache, constipation, frontal sinusitis, warts and scarlet fever. No man is sent away without something being done, and we feel that much working time has thus been saved, not only to the company, but also to the men themselves.

Probably one of the most important functions of the hospital department is the examination of the new employees. In the case of the pleuric plant this requirement is rigid, and every man must receive the consent of the physician in charge before he is allowed to go there to work. As a result, 9% of the men who have applied for this work have been rejected, causes for rejection being arteriosclerosis, mediastinal tumor,

heart lesions, asthma, albumin and casts, and chronic bronchitis. Without question this system has been the means of averting many accidents arising from "fume" poisoning.

The accident prevention feature of the hospital department is also of great value; not only are the men cautioned and instructed on the first-aid man's daily trip around the plant, but they are continually being advised as to safety when they call at the hospital. They are instructed, among other things, in regard to the proper clothing to wear, and are repeatedly told that goggles are available at all times. In addition to this, signs are posted through the buildings warning the men of the dangers. The equipment on hand for protecting employees, consist of goggles, respirators, helmets, pump for supplying air to men working in tanks, rubber gloves, boots and suits.

The department is thoroughly organized and gives a monthly average of 965 treatments of all classes. The men have gradually come to look upon the hospital as a place for their benefit, and have ceased, in a large measure, to regard it with suspicion. The spirit of the officials is admirable, and they have sought to cooperate in every way possible, and have never refused to provide anything asked for.

### Book Reviews.

*The Operating Room.* By AMY ARMOUR SMITH, R.N., Superintendent of Nurses at the Woman's Hospital of the State of New York. Philadelphia and London: W. B. Saunders Co., 1916.

This volume, intended as a surgical primer for pupil nurses, is a synthesis of operating-room technique. It is divided into a series of twenty-two convenient chapters dealing with various aspects of this important subject. Particular commendation is due to the chapters on terms used in surgery and the lists of instruments needed for various operations. Not all surgeons would, of course, agree in the details suggested throughout the work, but in the main it merits cordial approval. The book is well illustrated with fifty-seven selected text figures.

*The Practitioner's Vestibular Test.* Philadelphia and New York: Lea & Febiger, 1917.

The issue of this well-known style of test for 1917 contains the usual memorandum pages and in addition thirty-two pages of useful and convenient tables and data. It is published in four styles, weekly, monthly, perpetual and for sixty patients. It should continue its service and utility to general practitioners.



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## MEDICAL ASPECTS OF SOCIAL INSURANCE.

The current number of the JOURNAL, devoted to the medical aspects of social insurance, reflects only in a small measure the great importance of the subject. Social insurance in its many phases is still but little understood in this country. It is to be feared that it is only too true, as pointed out by various contributors to this number, that the medical profession has lagged behind in its interest in and its understanding of this new development which will inevitably cause a considerable upheaval in medical practice. As Dr. Cotton points out, the medical profession was caught unawares in the Massachusetts Workingmen's Compensation Act. This has led to an unfortunate feeling of resentment against all forms of social insurance. Perhaps the general attitude of the medical profession in regard to social insurance in general might be summed up somewhat as follows:—

Workingmen's compensation has come, and

we physicians do not think we have been fairly treated. Sickness insurance seems bound to come, and we suppose we have got to make the best of it, but we are going to fight it, and we hope that we can make an arrangement which will be satisfactory to us.

This rather fatalistic viewpoint is peculiarly unfortunate.

Social insurance ought to stand on its own merits, and its acceptance ought to be decided by the predominance of the benefits over the hardships. At the same time social insurance should not benefit any one group to the marked detriment of another group. In other words, while the medical profession is morally obligated in all reason and propriety to protect its own interests, it must view social legislation as a whole, and not that particular part of it which affects itself. This attitude is peculiarly important at the present time, since the last legislature saw the introduction of a bill for a statewide sickness insurance scheme. A state commission is now studying sickness insurance in addition to other forms of social insurance. This commission will report to the incoming legislature. State commissions are at work in California and other states. Presumably bills will be introduced into the legislatures of this and other states for sickness insurance, and it is likely that, in some states at least, some form of sickness insurance will be enacted into law. It would be indeed unfortunate if the medical profession of this state or of this country were to be put in the position of our British brother practitioners who found themselves, on account of a determined and somewhat unreasonable opposition to a movement to which they had valid objections only to a part, in the end completely ignored and apparently humiliated with the resultant loss of prestige to the profession as a whole.

Space does not permit the discussion of sickness insurance, or health insurance, as it is now known, in all of its broad aspects. There are a few considerations which may be briefly discussed.

The paramount consideration must be the need of such insurance. On this point ample data are now available. In the first place, statistics show the close relation between sickness and poverty. The absence of even a single pay envelope to the workingman often spells disaster. An important part of the program of sickness insurance is to continue a reasonable propor-



tion of the pay envelope during illness. It is evident that this helps to feed and clothe the family of the worker as well as the sick worker.

In the second place abundant statistics show that a considerable proportion of the poor who are out of work on account of illness receive no medical attention. From every point of view, particularly that in regard to early diagnosis and preventive medicine, such a state of affairs is undesirable. The aim of all sickness insurance schemes is to furnish medical service to all of the insured. From the point of view of the practitioner it will mean that there will be a larger number of sick to be attended, but it will also mean a sure recompense for this attendance. There is no general practitioner who, moved by the poverty of the workingman who is ill and without his pay envelope, does not in innumerable cases furnish his services either gratuitously or practically so. Under any scheme of health insurance the practitioner will be paid for such services. It is true that it is customary to compare the presumable services of doctors under any health insurance act to the rightly despised lodge or contract practice. It would be obviously intolerable that all practice under the workings of a health insurance act should descend to the low level of much of the lodge and contract practice. However, it should be remembered that lodge and contract practice are but the sporadic, ineffectual and ill-advised attempts on the part of poorly organized groups in the community to secure the benefits of sickness insurance. We can see in these groping efforts the underlying demand for sickness insurance. This demand has taken form in lodge benefits, fraternal orders, employers' establishment funds and the funds of certain unions. But the working of all these methods is haphazard, uneven, many times unjust and unfortunately does not include, because it is not uniform and compulsory, those who are in most need of sickness insurance. There is no good reason to suppose that the workings of any state sickness insurance scheme will not at least approximate the workings of the best of the well organized establishment and union funds under which many physicians already work with great satisfaction.

There is no doubt that the adoption of some scheme of sickness insurance will compel a rearrangement of medical practice, but it is our belief that, despite inconveniences, the medical profession will be benefited rather than injured by a proper sickness insurance act in

Massachusetts. Sickness insurance seems to us to be a long step toward the betterment of social conditions. Nevertheless there is ample opportunity for the introduction of unjust administrative details. We have the experience of Germany, of England, and of the Compensation Act in Massachusetts as guides to avoid possible pitfalls. It seems to us that the nature of the problem is rather different from the Compensation Act. In that Act the employer is essentially the sole contributor, and the insurance company the main administrator. Under sickness insurance, if the control is democratically divided between the three contributors, namely, the employer, the employee and the state, and if the administration is placed in the hands of local carriers, which are necessarily democratic, and readily susceptible to the local influence of the people who pay the bills, many of the difficulties and objections now arising out of the Compensation Act can be avoided. The administration of sickness insurance by the great insurance companies, mutual, perhaps in name, but not in administration, is certainly most undesirable. We bespeak, therefore, for health insurance a kindly and sympathetic as well as a critical attitude on the part of the medical profession.

#### SMALLPOX IN ROXBURY, MASSACHUSETTS.

THE recent outbreak of smallpox in the western part of Massachusetts, and the occurrence on December 7 of a case of the disease in Roxbury, appropriately calls renewed attention not only to the activity and vigilance of health departments but also to the importance of repeated universal vaccination for the complete protection of the community. Arrangements have been made in Boston for free vaccination at 17 Blossom Street, the headquarters of the West End Health Unit. Arrangements for vaccination in homes may also be made by telephoning to the Boston Health Department at Fort Hill 5100. Dr. F. X. Mahoney, health commissioner of Boston, has issued the following statement relative to the disease and the menace which it constitutes in the community:

The recent outbreak of smallpox in the western part of the State should serve as a warning to all unvaccinated persons in this city. Protection of ourselves from smallpox in this city can be obtained only by the vaccination and revaccination of its citizens.



"A study of this disease in Boston for the past 30 years shows conclusively that epidemics have occurred at intervals of 10 to 15 years. As a result of the outbreak of 1893-4, the city was well vaccinated and the disease necessarily disappeared. From that time until 1901, the next outbreak, the city was free from this disease with the exception of occasional cases that are imported into every large city.

"In 1901, after a lapse of eight years, the majority of the people had lost their protection by vaccination, and the disease again appeared in epidemic form, and before being brought under control 1500 cases and 277 deaths occurred. This great number of deaths from a preventable disease is a heavy toll for any community to pay when vaccination, which will afford absolute protection from this disease, is free to everyone in the city.

"At the present time in this city there are thousands of people who, vaccinated in infancy, have probably lost their protection from this disease; and also many thousands more who have arrived in this city and who are as yet unvaccinated.

"It is the duty of parents to see that not only themselves but their children are safeguarded and protected from this disease by vaccination."

In this connection there is interest in an opinion recently given by Attorney-General Attwill in reply to the following questions relating to vaccination and the validity of certificates for exemption from vaccination:

"Must the physician make a personal examination?"

"Must the physician making a personal certificate be the one who makes this examination?"

"Must the certificate be so worded that it shows that it is the opinion of the examining and signing physician that the cause stated is sufficient?"

"Must not the certificate be so worded that it gives it as the opinion of the physician who signs the certificate that the child is not a fit subject for vaccination?"

For the guidance of physicians, Mr. Attwill's reply may be quoted in part as follows:

"In answer to the questions submitted by you, assuming they relate to school attendance, it is evident that if a child desiring admission to a public school presents a certificate, signed by a regular practicing physician, that 'he is not a fit subject for vaccination,' with the 'cause stated therein,' the statute is complied with. Under this chapter a personal examination by a physician is not necessary, and hence your second question does not require an answer.

"Your third question is to be answered in the negative, and your fourth question in the affirmative. The statute expressly provides that the exemption certificate shall state that

the child 'is not a fit subject for vaccination.' That necessarily is a matter of opinion, and, as such, is the opinion of the physician signing the certificate. It would not seem necessary to require such physician further to emphasize his opinion by asserting that it is also his opinion that the cause stated is sufficient to justify his statement.

"The cause stated, in my judgment, must be an adequate and lawful one in order to give the certificate validity. A cause absurd on its face, showing a deliberate intent to evade the statute, would not be, in my opinion, a compliance with it."

## INDUSTRIAL HEALTH INSURANCE.

As we have pointed out in a previous editorial, the present issue of the JOURNAL is published as a special number devoted to the subject of industrial health insurance. The JOURNAL has, from time to time, previously discussed various aspects of this question, and will continue to do so until an equitable settlement of the entire problem is reached.

In addition to the material presented in the first part of this issue, attention is called to the publication in the miscellany department of a valuable table sent out by the American Association for Labor Legislation, which presents a compact summary of what other countries have done in the matter of health insurance legislation compared with the proposed provisions of the standard bill advanced by the association. A careful study of this table is earnestly commended to members of the profession. It will be found useful, also, to preserve for reference.

Attention is further called to a letter published in the correspondence column, pointing out what the author conceives to be two fundamental errors in the Doten Bill. As we stated editorially, in last week's issue of the JOURNAL, the original form of the Doten Bill is far from being satisfactory in its medical aspects. This bill is, at present, undergoing revision at the hands of the Massachusetts Commission on Social Insurance, which will, presumably, present a new draft of it before the next session of the Massachusetts General Court.

It is by no means the desire of the JOURNAL to discourage criticism or stifle opposition to the subject of industrial health insurance. For this reason we desire also to call attention to the address made by Dr. Eden D. Delphey, first vice-president of the Federation of Medical



Economic Leagues and chairman of its health insurance committee, at the meeting of the American Medical Association in Detroit, June 12 to 16, 1916, published in the July issue of the *Medical Economist* (pages 155 to 157). Reading between the lines of this article, however, it is obviously not the principle of industrial health insurance, but the proposed methods of its administration to which the author objects, and that is precisely our present subject for amicable discussion. As Dr. Delphy emphasizes, there is not on the face of the earth a more altruistic profession than that of the physician. Opposition to details of health legislation, whatever its source, is fundamentally dependent on real or fancied infringement of personal rights. It is for the physicians in discussing and determining their relation to prospective legislation to carry the same altruistic principles into their action that they do in ministering at the sick bed or in the perilous pursuit of the causes of infectious disease.

#### PROGRESS OF POLIOMYELITIS.

DURING the past week there has been a continued decline of poliomyelitis throughout the United States. The weekly report of the United States Public Health Service for Dec. 8, 1916, notes the occurrence of cases in October as follows: New York, exclusive of New York City, 334; New Jersey, 254; Pennsylvania, 250; Minnesota, 165; Illinois, 151; Michigan, 97; Connecticut, 91; and Wisconsin, 84.

In Massachusetts there were in October 702 cases and 150 deaths. Boston had 63 deaths, Holyoke 11, Lynn 9, Quincy 8, Dalton, Malden and Pittsfield 4, Melrose, Monson, Waketield and Waltham 3, and the following two each: Beverly, Brookline, Cambridge, Gloucester, Lowell, Newburyport, Somerville, South Hadley and Springfield.

Other deaths occurred in Belchertown, Belmont, Conway, Dedham, Everett, Haverhill, Hopkinton, Medford, Newton, Northampton, Stoneham, Swansea, Warwick, Watertown, West Springfield, Weymouth and Winthrop.

The October issue of the Public Health Bulletin of the Massachusetts State Department of Health comments as follows on the incidence and mortality of the disease during that month.

"In spite of the excessive number of cases of infantile paralysis reported during the current month, the total number of cases of communi-

cable diseases reported to the department is considerably lower than the total for the corresponding month last year, and only slightly higher than the total for the previous month of this year. All of the diseases, with the exception of anterior poliomyelitis, smallpox and mumps, show a marked decrease over last year's figures for October, especially diphtheria, typhoid and whooping cough.

"Basing an estimate on the incomplete records received, the fatality rate for anterior poliomyelitis for October bids fair to be a little lower than that for September. The fatality rate for September was 24.7. It will be noted that there is an increase of eighty cases of infantile paralysis in October over the number credited to September, making a total of 702 for the month. This increase has been largely in the metropolitan area. Boston heads the list, with an increase of about fifty-seven; Quincy with one of thirty-three, and Cambridge with one of twenty-two. The disease still persists in the western part of the State, but a diminution in intensity in that section is perceptible.

"Following is a list of towns in which infantile paralysis has appeared for the first time during the month of October:

"Andover, Amherst, Athol, Attleboro, Belchertown, Cheshire, Deerfield, Dennis, Easton, Egremont, Grafton, Halifax, Hatfield, Hollbrook, Hopkinton, Longmeadow, Ipswich, Manchester, Mashpee, Natick, Northboro, Northbridge, Swansea, Templeton, Walpole, Wenham, Westwood, Warwick, Whately, Wilbraham and Wilmington."

#### STATE CONTROL OF MEDICAL PRACTICE.

THE present situation as regards the relation of the medical profession to the public raises the question whether, in this community, we are to learn the bitter lesson taught the members of the British Medical Association who, because of their inertia and lack of initiative, had forced on them, by Lloyd George and an act of Parliament, a reduced fee scale and a legal limitation of freedom to practise medicine as they saw fit. The signs are many of State control widening its scope as our country gets older, in various activities of life, and especially is to be noted a tendency to regulate the practice of medicine through a more intimate supervision over the health of its inhabitants.

Compulsory industrial health insurance is coming. Bills have been introduced into the Legislatures of New York and Massachusetts and in this State a recess committee is studying the question and our State Medical Society, in June,



appointed a committee to attend the hearings of this recess committee so that when the difficult problem is solved, of defining just what obligations the profession shall assume, under the terms of the bill, the doctor's interests may not be disregarded.

Meanwhile the profession, with the assistance of business men, is making attempts to provide expert medical diagnosis and advice to the public at reasonable rates; to be regarded possibly as an offset to the former exorbitant charges of some of the so-called specialists, or the abuse of medical charity, so prevalent in the past. Group medicine, for a long time popular in the West, notably in Chicago, and in certain cities of the East, has recently received a new start in Massachusetts in the activities of the Pay Consultation Clinic at the Massachusetts General Hospital, as noted in the *JOURNAL* of July 6, the "Coöperative Medical Group" recently advertised in circulars, and the "Mutual Medical Association," incorporated at the State House a year ago.

Indications multiply that there is a necessity for the profession to adapt itself to the present medical needs of the public—for does not the profession exist for the care of the sick?—to see to it that the unfit are prevented from practising; that those physicians who are equipped with a meagre education shall not pose as specialists after having taken courses of instruction for a few weeks; and finally to give the present problems most careful thought so that whenever bills affecting the practice of medicine are brought before the Legislature, the profession may present a united front, and men trained in medicine, with well considered plans, rather than untrained lay legislators, may guide the way to wise laws.

### MEDICAL NOTES.

**HEALTH INSURANCE.**—The American Association for Labor Legislation has announced that it will hold its tenth annual convention in Columbus and Cincinnati, Ohio, Dec. 27-30. A preliminary program was recently issued by the Secretary, Dr. John B. Andrews, which provides for seven sessions to be held on health insurance and the eight-hour day, subjects which will be most prominent in state and national legislation next year. Health insurance is now the subject of investigation by state commissions in Massachusetts and California, and bills drafted by the Association, with strong back-

ing, are to be introduced into the legislatures of the principal industrial states next year.

Addresses on these vital subjects will be given during the convention by leading scientific authorities and representatives of labor. "The Need for Health Insurance" is the subject of a paper to be given by the President, Prof. Irving Fisher of Yale; Miss Julia Lathrop, chief of the Federal Children's Bureau, will discuss the Public Protection of Maternity; Miles M. Dawson, insurance actuary of New York city, will discuss "The Principles of Health Insurance," while Dr. Alexander Lambert, chairman of the Social Insurance Committee of the American Medical Association, will discuss Medical Organization under Health Insurance, and the Hon. John J. Lentz, President American Insurance Union, will discuss the Fraternal Societies under Health Insurance.

**AMERICAN MEDICAL EDITORS' ASSOCIATION.**—At the annual meeting of the American Medical Editors' Association held in New York City on October 25 and 26 especial interest attached to the symposia presented on "The Doctor and the Law" and on anti-narcotic legislation. Dr. George M. Piersol of Philadelphia was elected president and Dr. J. MacDonald, Jr., of New York, secretary and treasurer for the ensuing year. The executive committee consists of Dr. C. F. Taylor of Philadelphia, Dr. A. S. Burdick of Chicago and Dr. D. S. Fairchild of Clinton, Iowa. Dr. H. Edwin Lewis of New York was appointed chairman of the publication committee and editor of the journal of the American Medical Editors' Association. It was voted to hold the next annual meeting of the society at the McAlpin Hotel, New York, on June 4 and 5, 1917.

### EUROPEAN WAR NOTES.

**WAR RELIEF FUNDS.**—On Dec. 14 the totals of the principal New England relief funds for the European War reached the following amounts:

Belgian Fund .....	\$192,934.00
French Wounded Fund .....	164,944.76
French Orphanage Fund .....	71,774.80
Permanent Blind Fund .....	50,002.48
LaFayette Fund .....	21,195.03
Wittenberg Prisoners' Fund ..	2,080.65

### BOSTON AND NEW ENGLAND.

**SUFFOLK DISTRICT MEDICAL SOCIETY.**—It is announced that at the meeting of the Surgical Section of the Suffolk District Medical Society at the Boston Medical Library on February 14, 1917, Dr. Willy Meyer, professor of surgery in New York Postgraduate School and Hospital, will present the subject of the surgical treatment of bronchiectasis and advanced pulmonary tuberculosis. The development of thoracic surgery within the past few years gives particular pertinence to this subject; and the distinction of the speaker should ensure a large attendance at the meeting.



## TENDENCIES IN HEALTH INSURANCE LEGISLATION

This table presents only the main features of leading health insurance laws, omitting numerous minor qualifications. Most of the European countries mentioned have, in addition to workmen's compensation for accidents, and health insurance, provisions for the contingencies of invalidity, old age, and unemployment.

	Germany (Adopted 1883; in effect 1884; reclassified 1911)	Great Britain (Adopted 1911; in effect 1912)	Austria (Adopted 1888; in effect 1888)	Netherlands (Adopted 1913; in effect ?)	Norway (Adopted 1909; in effect 1911)	Standard Bill American Association for Labor Legis- lation
<b>Scope of Com- pulsory Insur- ance</b>	1. All manual employ- ees. 2. Other specified em- ployees (foremen, of- ficials, clerks, teach- ers, actors, musi- cians) receiving less than \$600 yearly.	1. All manual employ- ees between 16 and 70. 2. All other employees between 16 and 70 receiving less than \$768 yearly.	1. All wage-earners (ag- riculture, forestry, and homework ex- cepted). 2. All administrative officials receiving less than \$480 yearly.	All employees re- ceiving less than \$300-\$600 yearly ac- cording to locality (domestic servants, certain casual em- ployees, and certain taxpayers excepted). All sickness.	All employees over 14 receiving less than \$124-\$178 yearly ac- cording to locality (certain casual em- ployees excepted).	1. All manual employ- ees. 2. All other employees receiving less than \$1,200 yearly.
<b>Disabilities Cov- ered</b>	1. All sickness. 2. First 13 weeks of in- dustrial accident dis- ability.	All sickness and ac- cidents not covered by workmen's compensa- tion or common law.	1. All sickness. 2. First 4 weeks of in- dustrial accident dis- ability.	All sickness.	1. All sickness. 2. First 4 weeks of in- dustrial accident dis- ability.	All sickness, acci- dents, and death, not covered by work- men's compensation.
<b>Waiting Period</b>	1. For cash benefit: up to 3 days. 2. For medical benefit: none.	1. For cash benefit: up to 3 days. 2. For medical benefit: none.	1. For cash benefit: none, if illness lasts more than 3 days. 2. For medical benefit: none.	1. For cash benefit: up to 4 days. 2. Medical benefit not compulsory.	1. For cash benefit: 3 days. 2. For medical benefit: none.	1. For cash benefit: 3 days. 2. For medical benefit: none.
<b>Maximum Time Recoverable</b>	1. Cash benefit: 26-52 weeks for the same illness. 2. Medical benefit: (1) Until expiration of cash benefit. (2) Additional 52 weeks of convales- cent care optional. 50-75% of wages.	1. Cash benefit: 26 weeks in any 1 year. 2. Medical benefit: throughout life.	For the same illness, 20- 52 weeks.	26-52 weeks in any 1 year, but not more than 13 weeks in a year for an illness for which benefit has been drawn more than 26 weeks in the previous year.	1. Cash benefit: for the same illness, 26 weeks in any 1 year but not more than 39 weeks in any 2 consecutive years. 2. Medical benefit: un- til expiration of cash benefit. 60% of wages.	1. Cash benefit: 26 weeks in any con- secutive 12 months. 2. Medical benefit: un- til expiration of cash benefit.
<b>Cash Benefit</b>	1. Medical and nursing assistance and treat- ment. 2. Medicines and ther- apeutic appliances. 3. Hospital care. 4. Medical treatment to dependents optional.	1. Medical treatment. 2. Medicines and ther- apeutic appliances. 3. Sanatorium benefit for all forms of tu- berculosis. 4. Medical treatment to dependents optional. 5. Dental care optional.	1. Medical treatment. 2. Medicines and ther- apeutic appliances. 3. Hospital care. 4. Medical treatment to dependents optional.	Medical treatment and medicines pro- vided by voluntary sick clubs. Must be open to any insured person. Cash benefit not paid until ar- rangements for medi- cal treatment and medicines are made.	1. Medical and surgical treatment. 2. Therapeutic appli- ances, medicines op- tional. 3. Hospital and asylum care. 4. Medical and surgical treatment to depen- dents, medicines op- tional. 5. Dental care optional.	1. Medical, surgical and nursing assistance and treatment. 2. Medicines and ther- apeutic appliances, costing not more than \$50 in any 1 year. 3. Hospital care. 4. Medical and surgical treatment and medi- cines to dependents.
<b>Maternity Bene- fit</b>	1. Insured women: (1) Cash benefit 2 weeks before and 6 weeks after delivery; or (2) Home nursing assistance or hospi- tal care with half cash benefit. (3) Obstetrical, pregnancy and nurs- ing benefit optional. 2. Wives of insured men: optional.	1. Insured women: (1) \$7.20. (2) \$14.40 if wives of insured men. 2. Wives of insured men: \$7.20.	Insured women: (1) Obstetrical care. (2) Cash benefit for at least 4 weeks after delivery.	Insured women: (1) Cash benefit up to full wages during incapacity due to delivery. (2) Usual cash ben- efit during incapacity due to pregnancy.	Insured women: (1) Cash benefit for 6 weeks. (2) Medical treat- ment.	1. Insured women: (1) Cash benefit 2 weeks before and 6 weeks after delivery. (2) Medical, surgical, and obstetrical treat- ment and appliances. 2. Wives of insured men: medical, surgical, and obstetrical treatment and appliances.
<b>Arrangements for Medical Service</b>	1. Free choice between at least 2 physicians under written con- tracts with funds, if cost is not exces- sively increased. 2. Insured may be paid cost of medical ser- vice if reasonable con- tracts with sufficient physicians cannot be made.	1. Free choice among panel of physicians whose pay is ar- ranged by Insurance Committees accord- ing to official regu- lations. 2. Other arrangements permitted if num- bers on panel are in- sufficient.	Free choice among phy- sicians under con- tract with funds who may be paid: (1) Fixed salaries; (2) Capitation; or (3) By the visit.	Free choice between at least 2 physicians under contract with sick clubs.	Contracts with phy- sicians by funds.	Funds may arrange for medical service by 1. Free choice among panel of physicians or 2. Reasonable free choice among salar- ied physicians, or 3. District medical offi- cers, or 4. Combination of above methods.
<b>Financial Benefit</b>	20-50 times average daily wage. Min- imum of \$12 may be fixed.	None.	At least 20 times aver- age daily wage. Maximum, \$20.	None.	25 times average daily wage. Maxi- mum, \$13.50.	Fundal expenses Maxi- mum \$50.
<b>Contributors</b>	Percentage of wages from employer and employee.	Flat rate from em- ployer, employee, and state. Con- tributions of em- ployer and state pro- portionately in- creased for option- ally low-paid worker.	Percentage of wages from employer and employee.	Percentage of wages from employer and employee.	Percentage of wages from employer, em- ployee, commune, and state.	Percentage of wages from employer, em- ployee, and state. Employer's contribu- tion proportionately increased for ex- ceptionally low-paid workers.
<b>Insurance Car- rier</b>	1. District funds. 2. Other mutual soci- eties not operated for profit (establishment funds, nurses' funds, guild funds, etc.).	1. Cash benefit. (1) "Approved" soci- eties (Excluded em- ployees, establish- ment funds, friendly societies, etc.). Must be controlled by members and net ex- ceed 10% profit. (2) District "con- tributors' fund" if the outside soci- eties. 2. Medical and in- dustrial benefit rep- resentative. Insur- ance Committee in each unit.	1. District funds. 2. Other mutual soci- eties not operated for profit may be reorga- nized (establishment funds, registered and guild funds, etc.).	1. District funds. 2. Other mutual soci- eties not operated for profit may be reorga- nized (district funds, etc.).	1. District funds. 2. Other mutual soci- eties not operated for profit may be reorga- nized (district funds, etc.).	1. District local trade funds. 2. Other mutual soci- eties not operated for profit may be reorga- nized (district funds, etc.).
<b>Control of Cor- poration</b>	Employers and em- ployees' representa- tion 25 and 75 re- spectively.	1. Approved soci- eties. 2. District "con- tributors' fund" if the outside soci- eties.	Employers and em- ployees' representa- tion 25 and 75 re- spectively.	Employers and em- ployees' representa- tion 25 and 75 re- spectively.	Employers and em- ployees' representa- tion 25 and 75 re- spectively.	Employers and em- ployees' representa- tion 25 and 75 re- spectively.
<b>Government Supervision</b>	Local, state, superi- or and imperial in- surance offices.	In a few instances only.	Local and imperial offices under Ministry of Interior.	Insurance Committee in each unit.	Insurance Committee in each unit.	State Social Insur- ance Commission.



## Correspondence.

## TREATMENT OF HIP FRACTURES: A RE-JOINDER.

Boston, Nov. 22, 1916.

Mr. Editor:—

The evening of November 15 I spent, as it chanced, going over the chapter on hip fractures in a book of mine, published in 1910, trying to shape things up for a new edition, for I think I have learned something about this subject in six years. The next day I chanced to open the JOURNAL at Royal Whitman's most recent eruption.\*

I find little in it, save the curiously vituperative phrases heard before, often; not very interesting.

I take it we are all trying to find out how to treat hip fractures for the benefit of the patient; it is not apparent that such letters as Dr. Whitman's help much toward this end.

It is alleged that I am "obsessed" with the matter of impaction. Considering the fact that I have never advocated impaction in more than the rather small proportion of hip fractures that are loose or hopelessly displaced, "these seem harsh words!" Might one not say that a man who advocates abduction as the treatment in all hip fractures, without discrimination as to lesions present, and without x-rays, even, might have to defend himself against a charge of obsession?

There can be no doubt *today* of the vast prognostic difference between real fractures of the neck of the femur and those of the "base of the neck"; the trochanteric type. Can any one who talks treatment or results, publish alleged data without knowing what he has been dealing with, and "get away with it?"

So far as I could trace my cases, I have published them, and there have been a not inconsiderable number. I do not believe that artificial impaction solves the question of, or is indicated in, more than a minority of cases. In this minority it seems to have worked well. So far, I do not believe that abduction really locks the fracture, whether by leverage on the acetabular rim or by capsular tension (it is horribly hard to follow an allegation that is so inconstant), or that any effective locking can be maintained for the weeks necessary for consolidation.

The abduction position is desirable because it obviates undesirable muscle-contractions. It did not wait for Whitman to make itself heard, or practised.

The only point I have made in regard to hip fractures is that impacted fractures fare far better than those in which the impaction is absent; that the lacking impaction may be produced artificially; that cases of hopeless distortion, in neck fractures, may be reduced by manipulation, then locked by impaction; and that all these cases may thereafter be treated as one would treat an ordinary case, *acetabulantly* impacted! This sounds, I think, like a conservative statement, and it corresponds with my practice.

Since I came to this point of view, I have had far better results; excellent results, considering the class of cases presented! If anyone can show better results in this restricted class of cases, then I shall ask opportunity to see how he does it. But if anyone lumps *all cases of hip fracture together*, including all the "extracapsular" cases, and shows no x-rays, either of primary lesions or of end-results, then I shall feel justified in asking for actual data before opening a discussion.

Everyone knows that hip fractures occasionally show marvellously good results. Most of the cases of this sort I have found to be of the "trochanteric" type. These cases almost take care of themselves; with a nurse!

\* The customary notice of bombardment by writer or editor was not observed in this case.

What I want to know is, what becomes of the cases of *true neck fracture without impaction, or with extreme rotation*? These cases are the problem. Ordinarily treated, they do not do well. I have a string of cases that have done well under my scheme of treatment.

Will Dr. Whitman "come across" with cases demonstrated to be of *this type* with better results? I care nothing for the unclassified cases with alleged good results. Maxwell had more of these than Whitman has, I think.

This problem is larger than Dr. Whitman or myself. It involves the welfare of hundreds of patients. The question is not one of dialectics or abuse, but of facts. The question is purely as to what we should do with hip fractures, of the neck proper, in which there is no impaction, or in which impaction has occurred in such a way as to promise no real use of the limb after consolidation. I care nothing for the decision as to other types of fracture, types which do not do badly under any form of handling. The question concerns only this restricted type of fracture of the femoral neck.

F. J. COTTON, M.D.

## THE DOTEN BILL: ITS GRAVER ERRORS.

Boston, 9 December, 1916.

Mr. Editor:

I have read "The Doten Bill (House No. 1015)" as published in your JOURNAL Dec. 7, 1916, and also your very careful editorial, entitled "The Doten Bill." I agree with you that the proposition is one of grave concern for the medical profession. Out of an extended experience as a panel doctor in a "Kranken-Kasse" in Vienna, under the Austrian Act, let me try to answer the two questions you submit for the consideration of the profession.

1. Will health insurance improve the public health?

2. Will it improve the condition of those who have invested so much time and money in order to acquire the equipment necessary for the practice of medicine?

I answer "yes" to both questions, providing a health insurance act is properly drawn and administered.

If drawn and administered without due regard for the equities of all the parties concerned, my answer is emphatically "no."

A third question naturally follows: Is the Doten Bill drawn with due regard for the equities of all the parties concerned? Emphatically "no."

Finally, could the Doten Bill be so amended as to conserve the equities of all, without destroying its essence? "Yes."

It is a weakness of human nature, that it tends to follow a bell-wether. This may be predicated of the upper stratum, as well as of the mob. Previous to 1870 our silver, our jewelry, our toys, were tawdry were they not made in France. Bismarck demolished this idea when he confederated the German States, and thenceforth nothing seemed of value which carried not the trademark "Made in Germany." We have had German efficiency and organization dinned into our ears so constantly that we have lost the sense of other values. We have not stopped to consider that the cases are not parallel; that in Germany, where the individual is subordinated to the State, a certain efficiency and organization may produce a certain result, whereas in the United States, the individual being guaranteed "life, liberty and the pursuit of happiness," and the State resting on his consent, the application of German efficiency and organization may produce chaos. *Quod sit demonstrandum.*

Be that as it may, it is evident that the proponents of health insurance in America have fortified themselves by tracing health insurance to its source,—



the German Act,—and are arrayed with a mass of German statistics with which to confound the opposition. Now it is proverbial that statistics lie, and in this respect Germany is not in the bush league. Probably nowhere, however, are statistics and facts more at a variance than on the subject of health insurance. They point out, for instance, that since its inauguration, ten years have been added to the life of the average workman. This is important, if true, but the question arises, how much credit for this gain should be given to the medical profession for its triumph over pestilence and epidemics in general, how much to improved industrial conditions, rather than to the actual working of the insurance act? How unfair, for instance, to credit the drop in diphtheria mortality to the insurance act, when it belongs to antitoxin. What the Germans do not tell us, however, is that, in spite of statistics, the city of Vienna has more tuberculosis, in proportion to its population, than any city in the world; that the insurance act has been the cause of the worst kind of insurance and medical politics imaginable; that only the strong arm of the law has prevented its disrupting the medical profession; and that in the average "Kranken Kasse" diagnosis and autopsy are the things desired, recovery being a calamity.

Now the proponents of these American bills, either do not know these things, or they ignore them. In either case they are riding to a fall. They have adopted the high sounding slogan that "sickness is the cause of an enormous percentage of loss in industrial efficiency," and in so doing, they start their campaign with a fallacy, the one known to logicians as the fallacy of the consequent. They have inverted antecedent and consequent. Their slogan should be "Industrial inefficiency causes many serious conditions, among others a great deal of sickness." This formula gives us an opportunity to overcome two evils, instead of one. Political economy teaches us that intensive production in over-populated communities, while withholding natural resources, brings with it the law of diminishing returns, and eventually poverty and sickness. It teaches us that the remedy is emigration to less settled districts, and the opening up of the natural resources of these districts to correspond with the law of supply and demand, whence will flow health, wealth and happiness. Let us treat the effect, sickness, but let us not ignore the cause, industrial inefficiency. To those with Teutonic leanings, who doubt that this is the remedy, I point out that Germany, with her population pressing on the soil, saw the solution in emigration, and demanded her "place in the sun." What better proof is needed that, standing alone, health insurance was ineffective?

This somewhat lengthy preamble brings me to the Döten Bill. Let me ask its proponents to state without equivocation, whether it is a charity or a business proposition? If it is a charity, which I understand they deny, all must admit that it covers a multitude of sins. If it is a business proposition, conceived in the interest of business efficiency, let us be business-like about it. The bill, as drawn, is defective. I quote from your editorial, Mr. Editor, "As to the manner in which medical service is to be rendered, the bill is very nearly silent." Let me add that the silence is almost golden.

Let me hasten to dissipate the idea that I am a pessimist on the subject of health insurance. On the contrary, I am an optimist. My difference with the proponents of this bill is not one of substance, but only of form. I agree with their principle, and disapprove of their method. I do so, because while this matter is still *sub judice*, discussion may be valuable.

From time immemorial the physician has had an abiding faith, his share of hope, and, above all, an abundance of the greatest of these, charity. In its sweet name, no real physician has ever been called

in vain. History abounds with anecdote showing that the physician, depraved beyond hope, lost to all other emotions, still responds to the touch of charity.

But when we come to inject cut-rate methods into the practice of medicine, in the interest of business efficiency, we make the good doctor careless, the bad doctor worse, and purchaser will find that the goods delivered are not the ones he ordered. Under these circumstances, *carveat emptor*. The history of the German and British Acts; and of contract practice in our own country, shows conclusively, that this is the rock upon which they all foundered.

Let me put it another way. I agree with the proponents of this bill that public health is a purchasable commodity, just as carrots, beets and eggs. But the moment we say a thing is purchasable, we predicate further, that it has an exchange value, better known as the market price. When I agree to the premise, I do so only providing that it is followed to its logical conclusion. Let us say rather, that public health is a purchasable commodity, but only at its market price. Can this market price be determined? Easily, as I shall demonstrate by substituting a clause for one already in the act.

Are the proponents of this bill ready to pay the market price? "Ay, there's the rub." Yet it must be brought home to them, that if health insurance in America is to be a success, which all admit is questionable abroad, it must rest on a foundation, whose cornerstone is a fair fight and no favor.

A thorough analysis of the value of the Döten Bill would require the services of a mind with a legal turn, to which was added the gift of prophecy. Certain errors in it, however, are so outstanding as to be amenable to the law of common sense. Let me confine myself to two of them, for as they do not or do exist, so this bill is good, or no stronger than its weakest clause.

1. Legislation without representation is tyranny.

This is the first error, and may be called a geometrical one. The proponents of this bill have based their calculations upon the triangle: State, employer, and employee. I submit that all the equities of the situation call for a new survey, with calculations based, literally and metaphorically, upon the square. For, after all, this is a four-sided proposition: State, employer, employee, and organized medicine, with its allied branches.

The bill, as it stands, calls for three commissioners, political appointees, hence bending with the gubernatorial breeze, who shall delegate to themselves powers so plenary that the Czar of all the Russias might well be envious. These powers are so elastic, that they outstretch the proverbial imagination. One of the powers, so delegated, is sufficient to acquaint organized medicine with an entirely new conception of itself. I speak of the right to make contracts with physicians, dentists, etc.

At a stroke of the pen, we are converted from a time-honored profession into a time-serving trades union. We shall have joined the swelling ranks of Labor. We shall have qualified for the Labor Day Parade, and shall be expected to find our proper place in the alignment between the Steamfitters' Union and the Master Carpenters. And consider the clauses, for instance, each one of us hustling for a job, underbidding one another, our motto, "*occupat eubica extremum*," or the devil take the hindmost. Perish the thought! Have I a phobia when I think of these things? No, because to me they are stern realities. I know because I have seen them. Therefore, I say to organized medicine, while there is still time, "Awake!" Its very minimum demand should be for a representative on this board of commissioners.

He should be a man holding the degree of Doctor of Medicine from an A-plus medical school, and be elected for the position by and with the approval of the Massachusetts Medical Society.



No matter what his attainments, we can never be quite as well represented by one who does not hold this degree.

2. The bill as drawn is unconstitutional. In the first place, it is in conflict with a law which is already on the statute books. I refer to the "Medical Practice Act." Like it, or not, this law has certain effects. One of them is that it recognizes no discrimination; before it all physicians are equal. It assumes that physicians who have been approved by it are honest men, until it finds out otherwise. It does not place the burden of proof on these physicians. Having approved these physicians, it authorizes them to pursue their legitimate activities anywhere within the boundaries and confines of this Commonwealth. This is an inalienable right.

Now along comes the Doten Bill, embracing 70% of the population, and says to the physician, in effect, if not in words, "Your activities are to be curbed. Henceforth they must be parochial. Your territory is to be cut up. Later on, you will be told where you may and may not practice."

Clearly a violation of his constitutional rights, and of the dentists, pharmacists, nurses, hospitals, etc., equally. These are all equal before the law. Not satisfied with this parochial restriction, the Doten Bill goes farther. Having converted the State into parishes, it allows any employer having 250 or more employees, under certain ambiguous conditions, to establish his own medical plant. Opinion may be divided concerning the advantages of voluntary group medicine. Personally, I favor it; but what this bill advocates, in this particular, is compulsory group medicine—a horse of another color. It is clearly unconstitutional. It makes no difference, that by collusion, the State, a given employer, and his 250 employees, agree to hire a certain group of physicians.

This is an illegal combination restraining professional activities. The effect is class legislation in that it discriminates in favor of some, and against others by exclusion. Any compulsory contract under the Doten Bill is open to the same objection. Consider the effect in practice. I have had a patient who works for a large dry goods house; have had him for years. This bill takes him away from me and gives him to a group of physicians of whom he knows nothing. After a while he makes up his mind to work in the shoe business. The first group loses him to a second. With 70% of the population falling under this bill, private practice receives its death blow. I do not, however, believe, that as drawn, it will pass muster before the Supreme Court at Washington.

#### THE REMEDY.

The Doten Bill, properly amended, is a good bill. As drawn and published, it is greater than the State. This should not be. The State considers all physicians equal. The Doten Bill savors too much of Prussianism, of "*L'état c'est moi*." I recognize the fact that some sort of a disciplinary body will be necessary to govern the conduct of organized medicine in its relation to this act. Its construction I leave to others. I feel that the proponents of this bill, having shown such a tireless energy in the cause of humanity, may welcome some one else doing a little thinking. The field they have had to cover was enormous; the wonder is that they have done it so well. I am sure that they have often been discouraged in their work by the willingness of organized medicine "to let George do it."

I have never agreed with organized medicine in its policy of "*laissez-faire*." It has kept us apart from our fellow man. It has made simplicity mystery. At the end of this letter I append a substitution to be known as Part 2, Section 4, to be substituted for Part 2, Section 1, in the Doten Bill as published. This, with provision for medical representation on the Board of Commissioners, will conserve the equi-

ties of all concerned, and will not destroy the intrinsic value of the bill.

On the eve of this vital legislation, which will undoubtedly affect posterity, let us start aright, so that another generation, opening with the golden key of Thought, the jeweled box of Memory, shall arise and call us blessed.

#### PART 2.

Section 4. (To be substituted).

*Medical Service.* The carriers shall pay for such medical, surgical, and nursing aid at a rate, never lower than the fixed minimum, nor in excess of the fixed maximum rate, to be determined by the Massachusetts Medical Society and the various governing bodies of its allied branches. These fixed rates are for the purposes of this act, and are not to be construed as a free list for persons not carried under it. And further, the carriers shall allow the carried, freedom of choice in the selection of his medical, surgical and nursing attendants, provided only, that such attendants are licensed to practice their professions in this Commonwealth; and further, compulsion by the carriers, in this matter of choice shall be construed as a violation of this act, and upon conviction, such violation shall be punished by a fine of \$100, or one year in prison, or both. All other parts, sections, or clauses, in conflict with this section, are to be eliminated from this act.

Very truly yours,

JOHN J. HURLEY, M.D., F.A.C.S.

#### SOCIETY NOTICES.

NEW ENGLAND PEDIATRIC SOCIETY.—The forty-fifth meeting of the New England Pediatric Society will be held in the Boston Medical Library, Friday, Dec. 29, at 8.15 P.M.

1. Report of Council and nomination of officers.  
11. The following papers will be read: 1, Case Report, Wyman Whittemore, M.D., Boston; 2, "Some Observations with Sour Milk Feeding," C. K. Johnson, M.D., Burlington, Vt.; 3, "Difficulties in the Diagnosis of Diseases of the Hip-joint," A. T. Legg, M.D., Boston; 4, "Should All Milk be Pasteurized?" Richard S. Eustis, M.D., Boston.  
111. Election of officers.

Light refreshments will be served after the meeting.

A. C. EASTMAN, M.D., *President*.

RICHARD M. SMITH, M.D., *Secretary*.

#### MASSACHUSETTS MEDICAL SOCIETY.

##### SPECIAL MEETING OF THE COUNCIL.

There will be a special meeting of the Council in Sprague Hall, Boston Medical Library, Wednesday, Dec. 20, 1916, at 11 o'clock a.m., to consider the proposed legislation by the Massachusetts General Court on Industrial Health Insurance. The attention of Councilors is directed to the "Doten Bill," the full text of which may be found in the *Boston Medical and Surgical Journal* of Dec. 7, 1916, under "Miscellany." A special number of the *Journal*, devoted to Social Insurance, will be issued on Tuesday, Dec. 19, instead of on Thursday, Dec. 21, the regular date of issue.

WALTER L. BURRAGE, M.D., *Secretary*.

Boston, Dec. 13, 1916.

#### RECENT DEATH

DR. FREDERICK JAMES SANBORN died at his home in Spencer, November 20, aged 55 years. Dr. Sanborn was a graduate of the Bellevue Hospital Medical College in 1883, and joined the Massachusetts Medical Society in that year, having a residence in Holden. He had practised in Spencer for about 30 years.



# The Boston Medical and Surgical Journal

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## Original Articles.

### THE DIAGNOSIS AND CLINICAL CHARACTERISTICS OF GOUT.\*

BY JOSEPH H. PRATT, M.D., BOSTON.

"THE gout affords a striking proof of the long experience and wary attention necessary to find out the nature of diseases and their remedies. For though this distemper be older than any medical records, and in all ages so common; and besides, according to Sydenham, chiefly attacks men of sense and reflexion, who would be able, as well as willing, to improve every hint which reason, or accident might throw in their way; yet we are still greatly in the dark about its causes and effects, and the right method in which it should be treated." So wrote William Heberden in his "Commentaries" in 1782.

Although more than a hundred years have passed since these lines were penned, and although notable advance in the knowledge of gout has been made by clinical, chemical and pathological studies, yet the statement of William Heberden holds true today, for "we are still greatly in the dark about its causes and effects."

The disease is known to be definitely related to a disturbance of the purin metabolism. The blood in gouty patients usually contains two to four times as much uric acid as is found in health. After feeding food rich in purins the increase in the uric acid output in gout com-

pared with that in health is generally delayed and diminished. In the intervals between attacks of gout the uric acid output on a purin-free diet is generally less than normal. The acute inflammation of the joints in gout is followed by the deposition of sodium urate in the affected parts. In chronic gout, large deposits of sodium urate in the subcutaneous tissue frequently occur, forming chalk-like nodules called tophi.

The recent discovery by Folin and Denis<sup>2</sup> of a trustworthy method for determining the amount of uric acid in the blood and its clinical application has renewed interest in gout. The studies of the past three years, made with the aid of blood analyses for uric acid, have shown that the writers and teachers of fifty to one hundred years ago knew more about gout and its clinical characteristics than many of those who have written and studied the disease in recent years.

The greatest confusion exists in the minds of many practitioners in America today regarding this disease and its diagnosis. In some parts of the country the diagnosis is frequently made in conditions that are not gout; in other sections there seems to be a skepticism in the minds of many practitioners regarding the existence of such a disease. In New England I have found that chronic gout, even when tophi occur, is often mistaken for rheumatism or arthritis deformans. Some physicians of large experience in the Middle Atlantic States assert that they see gout frequently. Inquiry has shown that they mistake typical cases of arthritis deformans for gout, and the swellings about the joints, and even Heberden's nodes, for gouty

\* Read at the Annual Meeting of the Medical Society of the State of New York, Saratoga Springs, May 17, 1916.



deposits. One writer has diagnosed as gout 34 cases of arthritis that came under his observation in private and hospital practice in New York during a period of only a few months. These included seven cases in women, in whom true gout rarely occurs.

At one health resort, judging from my experience, many patients who have no form of joint disease are told that they are gouty and that "their system is loaded with uric acid." Only one of the arthritic patients I knew who had been there brought back the assurance from his physician at the Springs that he did not have gout, and, singularly enough, he was the only one who actually did have it. In his case the existence of tophi removed all doubt regarding the correctness of the diagnosis.

One of the chief reasons for the widespread misconceptions regarding the symptoms and signs of gout is the rarity of the disease in this country. Leading physicians in New York, Philadelphia and Chicago have told me within the past two years that they see very few cases in either hospital or private practice. In a paper published by Dr. J. M. DaCosta<sup>3</sup> of Philadelphia in 1881 he says, "There is a belief that gout is rare in this country, and typical gout is certainly rare." Dr. Horatio C. Wood<sup>4</sup> of Philadelphia in an address delivered in 1897 made the following statement: "I have seen two cases of typical English gout corresponding to Sydenham's description, and only two. We do not have it in this country." This was apparent confirmation of the assertion made by Sir Dyce Duckworth<sup>5</sup> a few years earlier that "In the United States of America gout is practically unknown." Dr. Osler,<sup>6</sup> writing on "Aente Gout in the United States" in 1895, states that "the comparative infrequency of gout in this country is a matter of everyday comment." He described three interesting cases he had seen during the previous year in private practice, and stated that he had, during the session of 1894-5 in the ward, four cases of gouty arthritis at one time, which was a unique event in his hospital experience.

Dr. Osler was convinced that the disease was often unrecognized in the United States, and in his clinical teaching he impressed upon the students the importance of a careful search for tophi on the ears or about the joints in every case of chronic arthritis. As a result Futeher<sup>7</sup> was able to collect in 1902 from the records of Osler's clinic no less than 36 cases of gout that were admitted to the Johns Hopkins Hospital during a period of eight years. A later statistical study prepared by Futeher<sup>8</sup> for his monograph in Osler's "System" was based on a series of 92 cases of gout observed among 30,871 medical admissions.

I am convinced that chronic tophaceous gout is less common in hospital practice in Boston than in Baltimore. For years I have made an

examination of the ears for tophi a routine procedure and rarely have I found them.

This assertion is supported by the statistics of the Massachusetts General Hospital. In the medical wards, from 1821 to 1916, there were only 41 cases diagnosed as gout among the 199,518 patients admitted.

#### CASES OF GOUT IN THE MEDICAL WARDS OF THE MASSACHUSETTS GENERAL HOSPITAL.

YEARS	NUMBER OF CASES
1821-1870	2
1870-1880	6
1880-1890	5
1890-1900	9
1900-1910	7
1910-1916	12
1821-1916	41

In the out-patient department of the hospital from August, 1903, to May 15, 1916, among 298,000 patients admitted to all the clinics, the diagnosis of gout was made 42 times. This makes a total of 83 cases collected from the records of 497,518 patients.

The fact that more cases of gout have been treated in the wards during the past six years than in any decade prior to 1910 suggests that the disease has been overlooked in the past, but possibly the use of Folin's method for determining the amount of uric acid in the blood has brought more cases into the hospital for study and treatment during the past three years.

In view of the widespread errors regarding the symptoms of gout, it is interesting to see what the medical students were taught about gout in the early days of this country at the three leading medical schools,—the University of Pennsylvania in Philadelphia, the College of Physicians and Surgeons in New York, and Harvard in Boston.

From Benjamin Rush,<sup>9</sup> for many years the professor of medicine at the University of Pennsylvania, the students could have learned little about gout that was sound, for his well-known essay on this disease is filled with errors.<sup>10</sup> There is no evidence in this record of his clinical observations that he had ever studied a case of true gout. A few quotations will indicate what a range of symptoms was regarded by him as diagnostic of gout. "The great toe and the joints of the hands and feet are no more its exclusive seats," said Rush, "than the 'stomach is the throne of yellow fever.'" In short, gout may be compared to a monarch whose empire is unlimited. The whole body crouches before it. . . The gout affects the glands and lymphatics. It produced a salivation of a profuse nature in Major Pearce Buller, which continued for two days. It produced a bubo in the groin in a citizen of Philadelphia. He had never been infected with the venereal disease, of course no suspicion was entertained by me of its being derived from that cause. . . "Scrofula and all the forms of dropsy are the effects, in many



cases, of a disposition of the gout to attack the lymphatic system. . . "A distressing collection of air in the rectum, which renders frequent retirement from company necessary to discharge it, is, likewise, a symptom of gout."

Contemporary with Rush there was living and teaching in London William Heberden, whose writings on gout are as valuable to our generation as the one for which they were prepared. In his long and extensive practice it is said that he saw as much of this disease as any physician ever did, but Rush in his writings was uninfluenced by the opinions of Heberden, and even the masterful clinical descriptions of the disease by Sydenham had upon him no restraining influence. From a study of Rush's essay, the conclusion seems justified, in view of the high esteem in which he was regarded by men of sense, that true gout was practically unknown in the American colonies.

The teaching in Boston regarding gout was doubtless along the lines followed by James Jackson<sup>10</sup> in his text-book of a course of lectures on the theory and practice of physic prepared for the use of students at Harvard and published in 1825. In this the diagnostic features of gout are not clearly or fully described. The chief symptoms that distinguish the disease from rheumatism are not given, and no mention is made of tophi. It is certain that the students saw no cases of the disease, for, although the Massachusetts General Hospital was opened in 1821, the first case diagnosed as gout was not admitted until 1845. This was probably an example of tophaceous gout, but characteristic features of the disease, if they existed, were not brought out in the clinical record.

In the clinical lectures of David Hosack,<sup>11</sup> professor of medicine at the College of Physicians and Surgeons in New York, there is an excellent description of gout. It is evident from his statements that he had some personal knowledge of the disease.

In the middle of the last century the standard text-book on medicine was that of George B. Wood,<sup>12</sup> professor of medicine in the University of Pennsylvania. To his teaching must be attributed some responsibility for the diagnostic errors of his students and readers. He held that a condition which he termed nervous gout was increasingly common, having, to a considerable degree, superseded the old-fashioned gout. "I have no doubt," he writes, "that much of the neuralgia, now so prevalent, is only gout or rheumatism in the nervous form."

Many physicians still hold the false belief that an increased output of uric acid in the urine or the formation of the pink or lateritious deposit is characteristic of gout. This error is due in large part to the view commonly held thirty years ago that a pathological state allied to gout exists, a "half gout" as it was called, and to which Murchison<sup>13</sup> gave the name lithaemia. DaCosta, writing in 1881, said that in this country "lith-

aemia is most common, and if it be true gout it is pre-eminently the American gout." The "abundance of lithic acid (uric acid) or lithates in the urine," said DaCosta, "frequently coexists with signs of ill-assimilation of food, with aches and pains unaccompanied by any perceptible changes of the aching part." As the aches and pains of neurasthenia were attributed to "lithaemia" or the "American gout," whenever a deposit of urates formed in the patient's urine on cooling, it must have followed that this diagnosis was frequently made. As late as 1895 a leading clinical teacher in a paper on irregular or atypical gout said, "headache, migraine, depression of spirits, shooting pains, cramps, palpitation and vertigo are a part of the symptomatology of lithaemia."

In the same year there appeared the American text-book of medicine, which contained an article on gout as misleading in its teaching regarding this disease as anything that had been prepared for the American medical student since the days of Rush. Gout, the author asserted, was the most conspicuous manifestation of the arthritic diathesis, and a concise and accurate definition of the term was impossible. According to him, gout and nineteen other diseases, which are enumerated, are all dependent upon "a peculiar and ill-defined retardation of nutrition that constitutes the arthritic diathesis."

The false ideas regarding gout and the hypothetical clinical condition "lithaemia" were so deeply rooted in the minds of physicians that fewer facts and more fancies concerning gout were taught in America in the latter part of the eighteenth century than by Heberden in England a hundred years earlier.

The admirable article on gout in the first edition of Austin Flint's<sup>14</sup> practice, which appeared in 1866, can be appreciated at its full value only by one familiar with the false views so generally held at the time it appeared. Flint coined the term "uricaemia" to designate the excess of uric acid in the blood which Garrod had shown to exist in gout. The false teachings regarding "lithaemia" and the "uric acid diathesis" never crept into this text-book of medicine, which always remained a trustworthy guide to the student. In his last revision<sup>15</sup> he showed the critical scientific spirit which pervades all his writings in his brief reference to this subject. "The designation 'uric acid diathesis,'" he said, "is used by some physicians in a rather indefinite way to describe various morbid states, which may not at any time be accompanied by deposits of urates and in which there is no proof of an excess of uric acid in the blood."

This criticism of Flint regarding the "uric acid diathesis" was well founded, as recent studies made with the aid of blood analyses, have shown that there is no increase of uric acid in the motley group of disorders which were regarded by Murchison and his followers as due to "lithaemia" and "uric acid diathesis."



*Symptoms of Acute Gout.* The clinical picture of a typical attack of acute gout has been drawn so clearly and so accurately by Sydenham<sup>16</sup> that it should be read and remembered by every student of medicine. I will quote a portion of his description:

"The victim goes to bed and sleeps in good health. About two o'clock in the morning he is awakened by a severe pain in the great toe; more rarely in the heel, ankle, or instep. This pain is like that of a dislocation, and yet the parts feel as if cold water were poured over them. Then follow chills, and shivers increase. After a time this comes to its height, accommodating itself to the bones and ligaments of the tarsus and metatarsus. Now it is a violent stretching and tearing of the ligaments—now it is a gnawing pain, and now a pressure and tightening. So exquisite and lively, meanwhile, is the feeling of the part affected, that it cannot bear the weight of the bedclothes nor the jar of a person walking in the room. The night is passed in torture, sleeplessness, turning of the part affected, and perpetual change of posture; the tossing about of the body being as incessant as the pain of the tortured joint, and being worse as the fit comes on. Hence the vain efforts, by change of posture, both in the body and the limb affected, to obtain an abatement of the pain. This comes only towards the morning of the next day, such time being necessary for the moderate digestion of the peccant matter. The patient has a sudden and slight respite, which he falsely attributes to the last change of position. A gentle perspiration is succeeded by sleep. He wakes freer from pain, and finds the part recently swollen."

To show the accuracy of Sydenham's description of genuine acute gout as the disease is seen in America, I will give the description as recorded in the clinical histories of four patients seen within a year.

C. F., aged 49. Seen April 5, 1915. About 1895 he had acute inflammation of the great toe of the right foot. There was marked swelling, redness, and extreme tenderness. The pain was excruciating and continuous. Even the weight of the bed-clothes increased it. For three nights he got almost no sleep. Duration of attack, about two weeks.

J. T., aged 40. Seen August 5, 1915. First attack of "rheumatism" in 1907. It began in the wrists. They were painful, reddened, and swollen. A day or two after the onset, both great toes became greatly inflamed. They were distinctly swollen, very red and shiny. If they were touched he "had to holler." The pain was more severe during the night. He scarcely slept at all until six o'clock in the morning.

D. T., aged 55. Seen June 16, 1915. First attack of gout in 1900 in great toe of right foot. One day he felt a little lame. The following morning about 4 a.m. he awoke with very severe pain in the metatarsophalangeal joint. The joint was swollen to the "size of an apple" and was as "red as a beet." It

was a jumping pain and continued for three or four days. It disturbed his sleep. He thinks it was worse during the night than day. He was confined to the house six or seven days. Relief was obtained by rubbing about the inflamed joint, but the joint itself was exquisitely tender.

Mrs. A. McC., aged 58. Seen Oct. 3, 1915. In January, 1915, attack of acute inflammation in the right great toe. Confined to bed two weeks. Onset very sudden. Felt perfectly well the previous day. Awakened at 4 a.m. with "terrible" pain. When morning came toe was greatly swollen. It was 2 to 3 times the natural size and it became very red. By night the whole foot was purple. Pain severe for several nights. The severe inflammation lasted two weeks. The tenderness was so great that she became uneasy as soon as anyone approached within two or three feet of the bed, for fear that the joint would be touched or moved.

*Seat of the Affection.* It is a remarkable fact that the disease usually vents its first fury on the great toe. All authorities are agreed upon this. Sir Charles Scudamore<sup>17</sup> found, in an analysis of 516 cases of gout, that in 373 the great toe was involved, either alone or with some other joints, in the first attack. In Garrod's<sup>18</sup> experience in not more than 5% of the cases was the great toe not implicated in the first fit of gout. In later attacks of acute gout, and especially in the milder joint manifestations of chronic gout, the great toe may escape and the inflammation be less typical. Hence it is important to obtain an accurate description of the initial attack and to ask every patient suspected of having the disease if the great toe has ever been involved.

*The Character of the Inflammation.* The classical symptoms of inflammation—dolor, rubor, and tumor—are present. I have seen a typical attack of gout in the elbow mistaken for a phlegmon, and an operation undertaken.

The pain is intense, amounting often to torture, and its severity is of great diagnostic value. In rheumatism, the disease with which gout is usually confused, the pain is not so great, and rarely causes much suffering unless the affected part is moved. Watson,<sup>19</sup> in those fascinating clinical lectures that will never grow old, says that the distinction between the two diseases was described by a humorous Frenchman in this way: "Place," says he, "your joint in a vise and screw the vise up until you can endure it no longer. That may represent rheumatism. Then give the instrument another twist, and you will obtain a notion of the gout."

Your own Hosack emphasized the severity of the pain in a way that probably stuck in the minds of the young students in New York a century ago. Let me quote from his lecture on gout:

"Some compare it to the gnawing of a dog, the pressure of a vise, or the pain of the actual cautery; this probably is not far from the truth, judging from the anecdote I have heard of a man subject to gout. This man falling asleep,



barefooted, before a large fire, the fire fell, and a large coal found its way to his foot; half awake and half asleep, he cried out, 'There's that d—d gout again!' He at length awoke, when he found a large coal frying his great toe. The sensation of the two evils was probably the same."

The exquisite tenderness of the affected joints in gout has been recognized by all authoritative writers since the time of Sydenham, yet a professor of medicine in a New York school, as late as 1896, states in a paper on gout and rheumatism that in "rheumatism, particularly when a joint is acutely inflamed, there is usually more superficial or cutaneous tenderness than in gout!"

The occurrence of edema in the gouty part and the subsequent desquamation of the skin are characteristics of the acute attack that are emphasized by Garrod. The attack usually lasts many days, and sometimes for weeks. There is some fever at onset, but the temperature is rarely high. Profuse sweating, so common in acute rheumatism, is said never to occur in gout.

True gout rarely develops before the age of twenty, and the onset is more frequent between the ages of thirty and forty than during any other decade (Sendamore). Hosack pointed out to his students that the disease usually occurs after the thirty-fifth year. He contrasted this with rheumatism, which "generally appears between puberty and thirty-five, in the greatest vigor of life—gout after that period—so that we may say, where rheumatism ends, gout begins."

One should always be suspicious that an attack of acute febrile inflammation of the joints occurring after the age of thirty-five, in a person who has never had a previous attack of rheumatic fever, is not rheumatism, but gout. Acute endocarditis, which is such a common complication of rheumatic fever, does not occur in gout. Another aid to differential diagnosis is the frequent association of gout and chronic interstitial nephritis, and the rarity of acute rheumatism and chronic Bright's disease in the same person. Some of the cases of polyarticular gout I have studied have closely simulated rheumatism.

In the following case the correct diagnosis was not made by the eight or ten physicians who had treated the patient during the twenty-seven years that he had suffered from recurrent attacks of gout. All had regarded the disease as rheumatic fever. I did not feel sure of the diagnosis until I saw the swelling on his elbow, which presented the typical picture of a chronic gouty olecranon bursitis.

C. A. P., male, aged 57. Suffered from "rheumatic fever" severely from the age of 30 to 52. He still has occasional attacks and is much crippled.

The trouble began in the ankle. In the first attack, there was great swelling of the ankle and leg. The skin was tense, dark red and exquisitely

tender. For 3 or 4 years the inflammation never extended above the knees. The knees since then have been more frequently inflamed than any other part. The feet have been often involved, sometimes the instep, sometimes the outer side of the foot, but never the great toe. Nearly all the joints have been inflamed in several attacks. Once "the jaws and all the other joints of the body" were affected and "all the muscles except those of the eyes and mouth." In the last attack, which came on about two months ago, the whole right hand was involved.

On account of lameness rarely walks upstairs; in fact, has been able to take very little exercise. Formerly the knee and calf of both legs would swell. For three or four years he has had swelling of the left lower leg and left foot. The extent of the swelling depended on the amount of walking he did. For years has been unable to get down on his knees. For 20 years he was more lame than he has been during the past two years.

During the attacks there was marked swelling and redness of the joints and high fever. Exquisite tenderness was a striking feature. Sometimes he has had 25 pillows under him at one time. Pain usually worse about 8 p.m. than at any other time—and more severe during the night than during the day. On one occasion the pillow under his head was not touched for 24 hours owing to pain on moving his neck. Repeatedly laid up 2 or 3 months at a time; once confined to the house for nearly six months. Duration of last attack about ten days. Fever has lasted for 2 to 3 months. Heart never involved.

Seven years ago, a nodule the size of a split pea developed on the fourth toe of the right foot and projected above the surface. It ruptured and discharged material that looked like "chalk and thick mucilage, but not well mixed." For over a week his doctor came and scraped the ulcer "down to the bone." A sinus persisted several years.

About two years ago two nodules formed in the skin on the pinna of the right ear, two or three times the size of a grape seed, of whitish color, containing chalk-like material. Another physician was then in attendance, but he still adhered to the diagnosis of rheumatism after the tophi formed in the ear.

The left olecranon bursa has been distended with solid material for three years. Inflammation and distention were frequent for 10 years prior to that. For weeks at a time has had both arms suspended in slings.

For ten years has taken 2 grains of morphine a day. He acquired the habit in attempting to get relief from the pain. Has never been given alcohol to his knowledge. Up to two years ago, took alcohol freely.

*Status Presentis.* Patient is a tall, strongly built, fairly well nourished man. Muscles flabby. Subcutaneous fat abundant over the abdomen. No palpation of the knee or membranes. Lungs normal. Enlargement of the heart to the left. A systolic murmur replaces the first sound at the apex. Aortic second sound not definitely accentuated. Arterial hypertension. Blood pressure, systolic, 220; diastolic, 110. No tophi in the ears. On the inner side of the left elbow is a small sack filled with hard, irregular masses like pebbles. It projects about 2 cm. beyond the olecranon, and is about 3 cm. wide. Near this mass in the subcutaneous tissue of the elbow are



several similar nodular masses about the size of split peas. No deformity of the other joints.

The blood contained 2.1 grams of uric acid on a purin-free diet, but 72 hours after eating 160 grams of sweetbreads the amount had increased to 3.4 grams. The uric acid in the urine on a purin-free diet was abnormally low. The urine was free from albumin at the time of my examination, but tube casts were present.

In this case the severity of the pain, the tenderness of the affected joints, the redness and the great swelling, the age of onset, the alcoholic history, the freedom from endocarditis, the existence of hypertonia,—all were characteristic of gout and not of rheumatism.

Genuine gout is rare in women. All but one of my 21 cases of undoubted gout, in which the uric acid was determined in the blood, have been in males.

In this country the hereditary form of the disease is far less common than the acquired.

The influence of alcohol in causing gout was known to the ancients. A Greek poet described gout as the daughter of Bacchus and Venus. Fermented liquors are the chief predisposing cause. Only two of my patients were teetotalers, and nearly all had taken alcohol freely. Porter and heavy wines, especially port, predispose to gout. Possibly the freedom from gout in America is due to the fact that light beer and whiskey are the alcoholic drinks chiefly used. Gout was rare among the workers in Scotland and Ireland, where whiskey is the chief beverage, and at the same time extraordinarily common among a body of men in London called ballasters, derived from the peasantry of Ireland, who did heavy work in the Thames. These men, according to Budd,<sup>20</sup> drank two to three gallons of porter daily.

An excess of animal food and a sedentary life have long been known to favor the development of gout. The relation between lead poisoning and gout was first pointed out by Garrod. He recognized that lead alone did not powerfully predispose to gout, as women engaged in white lead factories, who often suffered from colic, rarely had gout. Our experience points to the same conclusion. Although gout is so rare, lead intoxications in their milder forms, are common. The manifestations of gout among workers in lead have been especially studied by Lüthje,<sup>21</sup> who describes a "lead gout" with a characteristic clinical course. The disease begins at a relatively early age and quickly involves many joints. The tendency to tophi formation and joint deformity is more marked than in ordinary gout.

The term *chronic gout* is given to those cases in which the attacks are frequent, and deformity or rigidity of the joints occurs. The signs of acute inflammation are less than in the acute disease, but the duration of symptoms is longer. In fact, suffering and disability may be constant. In chronic gout chalk-stones are apt

to form. They are not found in any other disease. Although the most common site is the helix of the ear, they are often observed on the fingers and toes. A microscopic examination of material from nodules thought to be tophi should always be made. The beautiful acicular crystals of sodium urate are easily demonstrated. The frequency with which sodium urate is deposited in the olecranon and prepatellar bursae is not generally recognized. Inflammation of these bursae is almost pathognomonic of gout. In many cases the olecranon bursa on each elbow becomes converted into a hard rounded mass several centimeters in size.

*Radiograms in Gout.* In chronic gout the x-ray is often an aid in diagnosis, as characteristic changes in the bones frequently occur in this disease. These consist of small dark areas on the plates, circular in outline, with clear, sharp borders. They are usually found in the epiphyses of the affected joints, especially of the fingers, and are due to the absorption of bone from areas in which sodium urate has been deposited.

*The Urine in Gout.* When a gouty patient is on a purin-free diet the uric acid output is often low in the interval between attacks, but rarely below the limit of normal, which is placed at .3 gram per day. This was known to Garrod, but the error is still widespread that gouty patients excrete large amounts of uric acid.

For the day or two preceding an acute attack there is a fall in the uric acid output below the usual level. This is followed by a marked rise early in the attack and a secondary fall.

*Uric Acid in the Blood.* The evidence is conclusive that the uric acid is usually notably increased in gouty individuals in the intervals as well as during attacks. The average amount in my 21 cases of genuine gout, irrespective of diet, was 3.7 mg. per 100 grams of blood. In 156 non-gouty cases studied by Adler and Ragle<sup>22</sup> the amount was 1.7 mg.

In a few cases of undoubted gout the uric acid in the blood was found to be within normal limits, but even in these cases on a purin-free diet it was never below 1.4 mg.

The sweetbread meal has proved of aid in diagnosis. The patient is placed on a purin-free diet and the daily output of uric acid in the urine determined. After having been on this diet for at least four days, the blood is analyzed for uric acid and 150 to 300 grams of sweetbread (weighed raw) are fed. The purin-free diet is then resumed. The blood of a gouty subject 48 to 72 hours after the sweetbread meal has shown in every case examined an abnormally high amount of uric acid, while in control subjects this was not found. It is not improbable that this rise in the uric acid content of the blood may occur in certain cases of nephritis and in other pathological conditions.

Recent investigations have modified previous



ideas regarding the excretion of exogenous purins, but it is a fact that the feeding to a normal person of food rich in purins, such as sweetbreads, is followed by a striking increase of short duration in the excretion of uric acid. In gouty subjects the increased output is usually delayed and diminished.

This disturbance of uric acid metabolism also occurs sometimes in nephritis and it has been observed by Pollak in chronic alcoholism.

Pain or acute inflammation in the joints developing a day or two after the sweetbread meal is very suggestive of gout.

The subjects of chronic gout, according to Friedrich Müller,<sup>23</sup> are more susceptible than normal persons to uric acid. Workers in his laboratory found that subcutaneous injections of diluted solutions of sodium urate produced stronger inflammation in gouty patients than in normal persons.

**Therapeutic Tests of Diagnostic Value.** The prompt relief from pain produced by colchicum in gout is so striking that many have asserted that this drug is a specific in gout. It is certainly an aid in diagnosis, as colchicum does not have such a marked effect in relieving the pain in acute rheumatism or in other conditions which may be confounded with gout. Salicylates rarely have any marked effect in controlling the pain of acute gout.

The relief from the severe pain of gout by atophan is even more striking than that produced by colchicum. Its value in diagnosis is probably less, as it often is of considerable aid in checking the pains of non-gouty arthritis.

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## ANAPHYLACTIC ACTION OF GRAINS ON RESPIRATORY TRACT.

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IN this report I wish to demonstrate the cutaneous reaction, produced by proteids of wheat, barley, oats, corn and rice, and the anaphylactic action of the proteids of these grains, especially wheat, on the respiratory tract. I have taken wheat as a standard, on account of its frequent and common use in our daily diet. In my private cases, and in those of the out-patient clinic of the Massachusetts General Hospital, I have obtained reactions to wheat in one hundred cases.

The cutaneous tests are preferably made on the flexor surface of the forearm, keeping one and a half inches below bend of elbow, on account of hypersensitive area above this margin, area limited below to muscular part, above tendinous termination. When, from some cause, as in dermatological cases, this area is impracticable, I choose a clear surface, wherever it may be—arm, leg, back or abdomen.

Controls are always made on whatever parts tested; if using both arms for test at same time, controls should be made on each arm, as there are varying degrees of sensitiveness in different parts of the body, and corresponding areas; in many cases, for instance, the left forearm is more sensitive than the right. Suitable area is washed with alcohol 70%, with as little rubbing as possible.

Test material, whether in liquid or powder form, is applied to skin: linear incision, half centimetre in length, is made, at same time carrying proteid into the incised area. In making incision, I avoid drawing blood. In some cases, immediate hyperemia appears about incision, which is due to mechanical injury. This rapidly disappears before reaction from proteids takes place. Positive reactions appear in from two to twenty minutes, and are manifested by appearance of wheal, wheal and hyperemia, or hyperemia; many cases with onset of reaction, burning and itching sensations, in which patient is unable to locate till later the exact area of such sensations. My reactions are recorded from suspicious (S) to four (4) in comparison to control. Suspicious, represented by a slight hyperemia or elevation; four (4) being represented by wheal 1.5 centimetres in diameter, with or without hyperemia, or by hyperemia extending over an area of three centimetres,



with varying degrees of reaction between S and 4.

The following table shows skin reactions in cases in which grains produce anaphylactic respiratory disturbances.

TABLE I.

No.	WHEAT	BARLEY	OATS	CORN	RICE
1	3	2	2	1	4
2	1	0	0	0	0
3	4	0	8	3	0
4	2+	1	8	1	1
5	2	2	2	2	2
6	2	0	0	0	0
7	1	0	0	0	0
8	1+	0	0	0	0
9	1	0	0	0	0
10	3	1	8	1	1
11	1	0	0	0	0
12	3+	3	0	3+	8
13	3+	4	2+	1	0
14	3+	4	2+	1	0
15	3	4	0	0	0

Reference to the above table shows wheat giving the highest percentage, and with few exceptions the greatest reactions of the grains, which may be due to sensitization by its frequent use.

Taking wheat as a standard, represented by 1, ratio of reactions of grains in Table I is as follows: wheat 1, barley .46, oats .4, corn .4, rice .46.

Examination of Table II shows that in these cases, with few exceptions, the individual proteids of wheat do not give as marked reactions as wheat proteid, nor by the reactions could we decide that any individual proteid is a cause of the anaphylactic reactions. I believe that the anaphylactic reactions of wheat are due to its combined proteids rather than to any individual proteid. Disturbances of the respiratory tract, produced by proteids of grain, in series of cases, Table I, I classify as follows:

1. Vasomotor Rhinitis.
2. Cough.
3. Bronchitis.
4. Asthma.

I will now enumerate the subjective clinical

symptoms in the cases of Table I, according to classified respiratory condition.

No. 1. Male, baker for nine years; four years ago began with frequent and severe attacks of sneezing, profuse serous nasal discharge, lachrymation, itching of eyes, nose and throat. Symptoms all increased when working in bakery. Omitted bread and boiled cereals from diet, all symptoms stopped at once; bread and cereal added to diet, return of all symptoms.

No. 2. Male, baker for twenty years. For ten years, frequent attacks of sneezing, nasal discharge, lachrymation. Bread omitted from diet, free from all symptoms; bread added to diet, return of all symptoms.

Nos. 1 and 2 were desensitized to wheat. I prepared a watery extract of flour by adding water to flour, keeping in a cool place for twenty-four hours, then filtering; to watery filtrate was added alcohol to make 14% of whole solution. This stock solution gave four (4) skin reaction. By making a series of dilutions of stock solution, testing these dilutions, 1-1000 gave suspicious reaction. Of this 1-1000 I gave five minims first dose, giving dose every third day, gradually increasing dose, according to reaction; after second dose, both cases were relieved of all symptoms. No. 1 received seven doses; No. 2 four doses; treatment then stopped to see how long their immunity would continue. In both cases there was return of all symptoms two months after stopping treatments.

No. 3. Male, baker, worked three years in a bakery; did not work with flour until one year ago. Two months after working with flour began with frequent attacks of sneezing, free watery nasal discharge; omitted bread and corn from diet. Continued his work in bakery, working with flour, without symptoms.

No. 4. Male, baker, worked in bakery at intervals for ten years. Last two years when going into bakery, or works with flour, or in a room where anyone is working with flour, attacks of sneezing,

TABLE II.

SHOWING SKIN REACTIONS WITH WHEAT PROTEIDS AND THE INDIVIDUAL PROTEIDS OF WHEAT.

No.	WHEAT PROTEID	ARTIFICIAL WHEAT PROTEIN	WHEAT UNFRACTIONATED	WHEAT PROTEOSE	WHEAT GLOBULIN	GLOBIN	CATEXIN	PROTEID DECOMPOSITION	ALBUMEN AND PROTEOSE
17	4	3+	2+	3	4	0	1+	0	1+
18	12 3+	1+	1	1+	1+	1+	2	1+	0
19	12 3+	1	0	0	1	0	1	0	1+
20	1+	2	0	0	0	0	0	0	0
21	1	1	0	1	0	0	0	0	0
22	1+	2	0	0	1	1	1	0	0
23	3+	0	1+	0	1	0	0	1	0
24	12 3+	0	1+	0	0	0	0	0	0
25	1+	1	1+	0	1+	0	0	0	0
26	3+	0	0	0	12	0	0	2	2
27	3+	2	1+	1+	1	0	0	0	0
28	3+	0	1+	0	1+	0	0	1+	2



profuse serous nasal discharge, lachrymation, itching of eyes and nose.

No. 5. Male, baker, twenty years; for ten years frequent attacks of sneezing, nasal discharge; stopped using wheat bread, and boiled cereals, symptoms were relieved.

No. 6. Female, servant, frequent attacks of sneezing, watery nasal discharge, headaches for one year. Omitted bread from diet, symptoms stopped at once. Smallest piece of bread would cause return of symptoms.

No. 7. Female, seamstress, for one year frequent attacks of sneezing, watery nasal discharge, itching of eyes and nose. Bread omitted from diet, all symptoms stopped.

No. 8. Female, clerk, frequent attacks of sneezing, watery nasal discharge; symptoms began one year ago, with an acute cold. Omitted wheat from diet, symptoms stopped. This case probably began as acute bacterial infection of upper respiratory tract, with the bacterial proteids of acute cold, added to a system which was, no doubt, sensitive to wheat. Symptoms were produced as greater amount of a foreign proteid was added to an individual sensitive to foreign proteids. Bread omitted from diet, thus lessening the sensitive proteid. Symptoms were stopped.

No. 9. Female, stenographer; for three years sneezing, watery nasal discharge. By stopping wheat, one of the foods she was sensitive to, symptoms were relieved.

No. 10. Female, aged 60, coughed for two years, worse at night; cough so frequent and hard at night as to disturb sleep. Nose blocked most of the time. For twenty years frequent attacks of sneezing, watery nasal discharge, lachrymation. If working with flour, sneezing so severe, nasal discharge so profuse, would have to wrap towel about nose and mouth. Bread and boiled cereals omitted from diet; all symptoms stopped, nose clear, no cough, rest unbroken.

No. 11. Female, housework; for twenty years cough and bronchitis, shortness of breath, tired easily, no ambition. Wheat one of articles excluded from diet; in two weeks cough stopped, lungs clearer. Patient expressed herself as "able to take a deep, clear breath," does not tire easily, more ambition, able to do work she has not been able to do for ten years.

No. 12. Male, colored, ate barley soup, in a few hours, coughing, sneezing and shortness of breath.

No. 13. Female, school-teacher; asthma for five years. Bread and boiled cereals omitted from diet, free from asthma. Can bring on severe attacks by eating bread.

No. 14. Male, worked in biscuit factory for thirty-four years. Six years ago began with cough, which increased in frequency and severity; for three years asthma, during this time attacks have increased in severity and frequency—attacks every night. If entering biscuit factory, attacks come on at once, so severe cannot stay in factory. Change of climate without benefit. During rainy weather, attacks were continuous; as patient expressed him-

self,—"would nearly die." Bread, barley, oats, corn, eliminated from diet; attacks were relieved at once. With few other foods, to which he is sensitive, eliminated from diet, he is free from asthma, even during stormy weather. This man is now running his own bakery.

No. 15. Male, oil dealer, asthma for two years. Wheat bread eliminated from diet, attacks stopped at once. This case expressed himself as feeling better in one week than he had for three years. After avoiding bread for two weeks, he ate six slices of bread in two days, which brought on hardest attack of asthma he ever had. Omitted bread from diet. No return of asthma.

Nos. 1, 2, 3, 4, 5 and 14 all worked in bakeries, where considerable proteids entered by respiratory tract. In these cases the subjective symptoms developed at various periods from two months to twenty-nine years, after beginning work in bakeries. All these cases ate large amounts of bread. This, with the extra amount of wheat proteid, entering by inhalation, the toxic proteid was increased to more than these patients could assimilate without producing symptoms. By omitting from diet, bread and boiled cereals, to which they were sensitive, thus lessening the proteids which were anaphylactic to them, these cases were able to continue with their work in bakeries without disturbances of respiratory tract, thus showing they were sensitive to wheat, entering by gastrointestinal tract. With bread eliminated from diet, the amount which gained entrance by inhalation produced no anaphylactic subjective symptoms.

In all other cases, working at different occupations, the foreign proteids gained entrance only through the gastrointestinal tract.

I have shown by these cases that the proteids producing anaphylactic reaction, enter by (1) gastrointestinal tract, (2) respiratory tract.

Boiled grains gave a greater skin reaction than raw grains. Those cereals prepared by extreme dry heat, 300-500 Fahrenheit were changed by the heating process in such a way that their proteids were rendered non-anaphylactic to many individuals. Some cases show skin reactions to these high-heated, prepared cereals, and in these cases anaphylactic effects are produced by ingestion of these prepared cereals; which shows that high, dry, heated cereals do possess anaphylactic properties which are manifested in some individuals.

In some cases, which do not show skin reaction to high-heated prepared cereals, anaphylactic results can be produced. A series of cases giving wheat reactions were tested with yeast; in no case was the reaction obtained. One would thus form the conclusion that the yeast which enters in the making of bread has no anaphylactic action.

My series of pollenosis cases showed skin reactions to grain as follows: wheat 100%, barley 66%, oats 64%, rice 82%, corn 90%. On the other hand, not all grain cases showed skin



reactions to pollen of trees and plants. Many of my pollenosis patients who avoided bread and boiled cereals, and used as substitutes those high, dry-heated prepared cereals, to which they were not sensitive, found their symptoms diminished. Pollenosis cases were desensitized in less time, when eating these prepared cereals to which they were not sensitive.

In my early work with grains, I first used a watery solution. Later, my testing materials were prepared by adding water to flour, letting stand for twenty-four hours on ice, then boiling for one hour, again adding water, setting aside in a cool place for twenty-four hours, then filtering and allowing the watery filtrate to evaporate to dryness, and reducing it to powder.

I am now using grain proteids prepared by R. P. Wodehouse of Laboratory of Plant Physiology of Harvard University.

#### CONCLUSIONS.

Proteids of grain have a distinct anaphylactic action on respiratory tract in some individuals.

This anaphylactic reaction manifests its action on different parts of the respiratory tract in various ways. The entrance of these foreign proteids is by the gastrointestinal and respiratory tracts. Heating has effect on proteids; boiling increases their action. High temperatures of 300-500° Fahrenheit will destroy anaphylactic properties of these proteids for many; but even after 500° Fahrenheit for a half hour, there remains an anaphylactic proteid to which some are sensitive.

The cutaneous test is a valuable means of diagnosing the foreign proteids to which individuals are sensitive.

#### FORSYTH DENTAL LIBRARY AND MUSEUM.

THE trustees and director of the Forsyth Dental Infirmary for Children announce that at their meeting in October, 1916, a new department was established, to be known as the library and museum. In an institution composed of so many departments, this branch of dental progress is liable to be overlooked. The new library and museum are intended for preserving the results of experiments and discoveries made and of work done at the institution. For the development of this project, assistance is needed. Physicians and dentists are, therefore, cordially invited to contribute to the library, past volumes or numbers of dental journals, and any pathological specimens having reference to the aural cavity. For these, permanent acknowledgment will be given. Every assistance and cooperation will be welcomed in the effort to make this library and museum, like the institution which houses them, of unique value. Suggestions will be gratefully received by the trustees, director, librarian and curator, and information will be gladly furnished.

## ROUTINE MENTAL TESTS AS THE PROPER BASIS OF PRACTICAL MEASURES IN SOCIAL SERVICE: A FIRST STUDY MADE FROM 30,000 CASES CARED FOR BY 27 ORGANIZATIONS IN BOSTON AND SURROUNDING DISTRICTS.\*

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#### PART I.

#### THE NEED FOR SOCIAL AGENCIES TO STANDARDIZE THEIR USE OF MENTAL TESTS.

IN a brief discussion of social service, which was included in a reading before the American Medical Association of June, 1913, Dr. Southard of the Boston Psychopathic Hospital said, "Progress should be made in every community to determine the dimensions of the social problem as it affects the psychopath."<sup>1</sup> To this end the social service departments of the psychopathic hospitals and clinics are endeavoring to work. On the other hand, economists and social workers have yet to determine the dimensions of the problem of the psychopath, as he affects society. The purpose of this paper is to discuss particularly the latter phase of mental welfare work.

More and more often social agencies are trying to determine to what extent mental disorders are responsible for their particular problems. This knowledge is being sought by organizations attempting to prevent the evils undermining social welfare, as well as by those working to alleviate and improve poor conditions, whether for the individual or for the public. In the endeavor to get opinions on individual cases, these organizations are turning to the mental specialists, to psychological clinics and to psychopathic wards and hospitals, for the diagnoses which will indicate to them the best course of action to be pursued in their respective problems. During the fiscal year of 1913-1914 of the Psychopathic Department of the Boston State Hospital,<sup>2</sup> 679 patients from a total of 3054 admitted to the House and Out-Patient Department (or one in every four admissions) were known to have been sent at the instigation of court officers, churches, settlements, social service departments in stores, family rehabilitation, relief and child-caring agencies. This number shows an increase over the figures of the previous year, due, in part, to a wider knowledge of the Hospital among agencies, as well as to a more general understanding and acceptance of the purpose of the Hospital by the patients

\* Read at the Third Annual Conference on the Medical and Social Work of the Psychopathic Hospital, June 18, 1915. Being Contributions to the Massachusetts Commission on Mental Diseases, Whole No. 162 (1916.20). The previous contribution was by Mary C. Jarrett (1916.19, 161), entitled "The Intensive Group of Social Service Cases," THE BOSTON MEDICAL AND SURGICAL JOURNAL, Dec. 7, 1916.



themselves. But so far the patients sent by social organizations have been largely those whose difficulties or peculiarities have been so distinctly marked as to class them definitely as psychopaths,—a term which may be understood to include, in general, the epileptic, insane, feeble-minded and doubtful or borderline patients, and those persons with such other mental defectiveness as would result in their being distinguished as generally asocial.

If one should ask the organizations why these 679 patients were chosen to be given a mental examination, from many others who might have profited by it equally as well, one would find that there is no standardized system for making the decision. Some agencies dealing with the same type of individuals use the clinic and hospital freely, others but occasionally. Some, for example, feel that every unmarried mother should be carefully examined in order to procure a working basis for the plans for her future; others look only to the weeding out of the dependently feeble-minded, or the troublesomely insane mother. One thinks no plan for a dependent child should be made without first determining his mental status—and his intellectual characteristics; others, again, employ psychological examinations only to aid in securing custodial care for the feeble-minded children. This lack of standardization in the selection of patients to be examined is probably due not only to various opinions as to the importance or significance of such examinations, but to an unfamiliarity with the signs of beginning psychoses and borderline defect, on the part of the community, as well as social workers. But whatever the reason, it is true that the decision as to whether or not an individual shall be given such an examination, or even observation, rests much as did the question of investigation in the early days of organized charity,—upon the judgment of the unspecialized agent or authority in charge.

Social organizations now are in a transitional period with respect to their recognizing the importance of measuring, scientifically, the mental capacity of the persons for whom they undertake treatment. They believe theoretically that the need of an individual, whatever its nature, cannot be met without an appreciation of his physical, moral, economic and mental condition. They employ trained workers to investigate the economic and moral situations. The physician is turned to frequently, though not as much as he should be, for advice as to the physical condition, but the average society relies upon the understanding and judgment of its workers for the recommendation that a person be given a mental or psychological examination. Such a standard for the use of mental tests meets the need of the individual and of the organization in a varying degree, dependent upon the experience with psychopathic individuals and knowledge of psychopathic diseases

which the worker may have had. It also has the disadvantage of singling out certain persons as suspectedly defective, and the patient himself is apt to resent it.

There was a similar transitional period when Frederick Osanam, the founder of the St. Vincent de Paul Society,<sup>3</sup> Thomas Chalmers,<sup>4</sup> Octavia Hill<sup>5</sup> and other pioneer workers in organized charity and reform movements, urged investigation as the only scientific basis for rendering charitable assistance of any kind. At first an investigation was made very guardedly and very superficially by the societies then in a position to make one. As time went on, certain cases were inquired into carefully as a matter of principle, but others were put aside as "too sensitive to be investigated." "evidently all right" or "because the society was too rushed at that particular time to go thoroughly into the inquiry"; and many well-meant corrections, kindnesses and alms went astray their mark because of it. It was years before social organizations of every kind took up the battle cry of "knowledge first"; and now no efficient agency or institution feels itself capable of giving advice, aid or supervision to any individual without first obtaining, through the services of a trained social worker, if possible, an intelligent understanding of that individual's social, moral, and economic history and, to a limited extent, his physical condition. Why should not one's mental history and mental calibre be of equal importance and be obtained in the same manner, that is, as *routine*? It is fundamental in every situation.

At one time in the history of the development of philanthropies, *routine* was a word which was to be avoided. That was in the early days of public charity, when meagre relief was doled out without respect to person. With the turning of interest toward the individual,—which first prompted investigation,—the public has been shown the dangers of blind routine, and has appreciated the general efficiency of intensive work with persons. Organizations have become *social*, as far as individuals and their relation to each other are concerned; but as Dr. Southard has so often said, the interpretation of *social* should not be confined to work with individuals or local communities. It stands for *society*, for *mankind*, and its meaning can be interpreted only through work with large numbers, unselected, and so dealt with that fundamental principles may be discovered. There are but few organizations which give time for the consideration of the particular conditions of their clientele en masse. Those agencies which do are leading those which do not; they are promoting genuine reforms.

With respect to the immediate problems for which each organization is instituted, each recognizes its own function: the Juvenile Court to decide whether a child shall be sent to a correctional institution or to a training school for



the feeble-minded and defective delinquent, or given indefinite custodial care. The Family Rehabilitation Agency, to decide whether parents are morally and intellectually capable enough to warrant keeping the family together, supplementing its income and supervising its development. The Child-caring Agency must know which children shall be offered for adoption and which ones for merely temporary care, which ones with special training in early years may be made self-supporting and self-protecting, and which must always be supervised. Church representatives must decide which parishioner will be wisely helped quietly, and which will be injured by aiding him without first consulting those who have known him the longest. The social service worker in the store must know whether or not she shall intercede on the part of an employee for another trial, and should be ready to say whether the employee is passing through a period of a day or a month when he is physically and mentally irresponsible,—at which time he is probably called lazy, eccentric, and impertinent by his co-workers,—or whether he is actually taking advantage of his employer. The inevitable Homes for Dependent Women, with their large number of cases of illegitimacy and drunkenness, must decide the best method of collecting accurate data, which will be of value in the general study of illegitimacy and intemperance.

An organization usually realizes its own limitations in its case work, and when the conditions of a problem show that the limitations have apparently been reached, the organization is turning more frequently to the mental specialist for advice. But why not establish the mental status of the individual first, and plan accordingly from the beginning? Why wait until all plans have failed and the workers are thoroughly discouraged? Every exaggerated instance of mental defect or disorder is comparatively easy to detect, but it is the apparently normal person, ill-fitted to his surroundings and misunderstood, who suffers most by unscientific treatment. The following stories illustrate some of these misunderstood types which come to us:

A young woman, 37 years of age, socially diagnosed as "a neurasthenic, who thinks the churches and social agencies owe her a living" (the diagnosis of neurasthenia having been made by an unspecialized physician, who had been consulted), was dropped by all who had helped her for some time, and given the advice that she was able to work and should take care of herself. She had a disfiguring acne eruption on her face, and explained it to the Hospital as due to a slow poison which her friends and relatives had been putting in her food for a number of years past. She had been restless in her work, frequently changed her positions, and as time went on became so paranoid that in the early spring her acquaintances persuaded her to go to the Psychopathic Hospital. After three

weeks' observation, during which time a careful history of her early life and habits was obtained, the diagnosis of dementia precox was made. On her discharge from the Hospital, the nature of her illness was explained to a former employer, who agreed to give her work again. Her acne was treated at another hospital, and finally cleared up entirely. A change in lodging was made, good meals and exercise were planned for her, and very soon her life was proceeding without friction. Her work was so good that she was one of five women kept steadily employed during the dull summer season. She had established herself without financial aid from anyone, and by the end of the summer she had paid her debts from her own savings. In case she should have a return of the former symptoms, which unfitted her for work,\* she will be returned to the Psychopathic Hospital for another period, while her place will probably be held for her by her employer, who understands the situation.

A girl of ten, in a reform school, was a difficult one to place in any department of the institution. She was never malicious, was attractive and very likable, and in some respects did well in school, but she quarreled with the girls in one division and complained so much of the officer in charge that she was transferred to another. Her work was slack. In the kitchen she couldn't "get along with the cook" and in the laundry it was the supervisor. In the school-room, her excuse was the same. She "couldn't get along with the people" she lived with. Finally she was put in the farm cottage, but even there, though other troublesome girls had shown improvement, she showed none. At length she was given the much-sought task of "tending the cows." When the cows did not return at the usual time, an officer went in search, and down by the fence in the pasture, sat the child in tears, sobbing that she "just couldn't get along with those cows." An examination later showed mental defect, and the child was transferred to a school for the feeble-minded.

A "complaining, lazy" father of a family of six children had been the loadstone of agencies and employers for seven or eight years. After much time and money spent in finding new employment for him and furnishing the means of livelihood for his family, he was brought under observation at the Psychopathic Hospital and diagnosed as a general paresis. He was committed to an institution for the insane, and plans made for the family by the agency in charge. The long-disputed question as to whether the father was able to work, or should be made to contribute toward the support of his family, was removed.

Miss N., a plaintive little woman of 27 years, with an illegitimate child, had been helped by all the child-caring agencies and other agen-

\* It is believed by some that in cases of dementia precox the patient frequently goes through a period of many months—even years—before the attacks of dementia are repeated. (See Kraepelin.)



cies interested in the problem of the unmarried mother, but she gave endless trouble. She was either complaining of the persons who were boarding her baby, or, if keeping her child with her, Miss N—— found it impossible to care for the child and do the work required. For several years frequent changes had been made by the obliging workers, who tried to please her. Upon investigation, the history and references which she gave proved fictitious, and it was frequently found that she was untruthful about other things. Finally all these agencies "closed her case" and had no more time to give to her. It was at this point that the Miss N—— came one day to a new agency. From the Confidential Exchange report it was evident that she should be returned to one of the societies formerly interested in her, but as each in turn refused to assume any further responsibility for her, the new agency undertook the work, and attacked the problem from another point of view. The applicant was undoubtedly worn out physically. A rest was promised her upon her consent to have a physical examination. She was sent to the Psychopathic Hospital. The report from there showed an active process of gonorrhea, a generally weak physical condition, and a mental classification of moron. Her baby also had a gonorrheal infection. Both were sent to the State Infirmary for treatment, where the mother stayed for three months.

In each of the foregoing situations, the advice of a mental specialist and of a psychologist was needed to determine the real nature of the problem, which to the lay worker had appeared to be entirely social.

If a system were in use for uniformly securing mental and physical examinations, including the Wassermann test, many of the difficulties which agencies now face would be obviated. The lay worker has questioned the value of the use of mental tests, but psychologists and physicians claim that they yield important results, if used carefully by specialists. Various methods of examining have been proposed.<sup>1</sup> The Binet-Simon scale<sup>2</sup> and the Healy<sup>3</sup> tests have, perhaps, been most generally in use. With patients whose defect proved decidedly marked, the examinations by these two methods were helpful to the agencies employing them, but for the patients classified as doubtful or borderline, the "all or none" method of the Binet scale did not truly represent their ability.

The Yerkes-Bridges Point<sup>4</sup> Scale, which has been devised at the Boston Psychopathic Hospital, has there supplanted the Binet scale. To quote from a recent publication regarding it:

The Point Scale "has been constituted with a view to simplicity and uniformity of use for measuring a variety of the aspects of mental capacity. The scale consists of a single series of tests, all of which are supposed to be applied to the individual under examination. For each test credit is given according to the merit of the subject's response, and the name, Point

Scale, is fitting because the subject achieves a varying number of points of credit according to his mental ability. The method provides for the comparability of the measurements made on individuals differing in age, since a large number of the mental functions which are considered exist in varying degrees in all the individuals examined. Finally, the Point Scale contains in itself the provision for improvement and for increase in the value of its results, since the series of tests may at any time be thoroughly revised in the light of the results obtained, and since the calculating of norms will inevitably increase the possibilities of interpreting results and of exhibiting any given individual in his relations to any group or collection of groups in which he belongs, and in comparison with whose mental status he should be considered and treated.

"The present Point Scale is to be regarded as a preliminary to the development of a universally applicable scale."

For measuring the mental capacity of illiterate foreigners, special tests have been standardized by Dr. Howard Knox<sup>5</sup> of the United States Public Health Service, New York. Acting Assistant Surgeon Shier<sup>12</sup> of the United States Navy has devised a system which is said to be especially adapted for the examination of applicants at the recruiting stations. Because of the many forms of mental tests and the accompanying claims and criticisms as to their respective values, there has grown up a distrust of their having any practical use other than that of detecting the markedly feeble-minded. If that were their only virtue, they would still be of distinct service to many institutions.

Passed Assistant Surgeon Sheehan of the United States Navy says:<sup>13</sup> "Methods of testing intelligence have been in use in psychological laboratories for many years, but it is only of late that they have been applied to the practical problems presented in pedagogy and psychiatry. As a result of their widespread use in these fields, it soon became apparent that they might be utilized to advantage by the military service as a means of excluding defectives. Considerable work has been done in the endeavor to adapt them to this purpose.

Due to the fact that these tests have been claimed by the popular press, and even by technical writers as an exact means of judging the mental and moral mechanisms of any normal or abnormal person, they have come into wide use, and often by persons having little or no scientific knowledge. Therefore, their true value has been lost sight of through uncritical exploitation and mystification."

But, aside from detecting the feeble-minded persons, these psychological examinations also record the success or failure of an individual's performance of certain tests. When given carefully and under conditions which place the individual at ease, these results should be a fair representation of his ability to do these tests, and the data should form a basis for valuable comparison with the results of future examinations.



If such an institution as the United States Navy Recruiting Station can find the use of psychological tests, given under favorable conditions, useful, surely organizations dealing with the dependent, delinquent, and distinctly asocial individuals, should find the use of them equally valuable.

By securing the psychological and medical diagnoses of social patients, social organizations, as well as other organizations, would not lose sight of the needs of the individuals. The diagnoses should be but a step toward more intensive work for them, and should indicate to the agent, the tendencies in the patients to be guarded or repressed and those to be strengthened or supplemented.

If such examinations were required as routine by every agency undertaking to supervise for any length of time the life of a child or an adult, the applicant who now considers the suggestion of such examination an implication that he is insane or feeble-minded, would come to look upon the process as he would upon the test of scholarship or ability,—as an effort to rank him with thousands of other people,—or an attempt to obtain a register which would point out to him, as well as to his supervisors, his weaknesses and his strong points.

The applicant would come to welcome the technic which enables the clinic to detect in his younger children the early stage of the disease which caused his oldest child to waste away as a juvenile paretic. He would appreciate the explanation that one child should be watched and trained with more care than the others, in order to give him a chance to cope equally well with the vicissitudes of life; or even the advice that a third child needed institutional training or custodial care, or that he himself should have treatment for syphilis as a safeguard against general paralysis or total blindness in middle life.

But, aside from the applicant's appreciation of the system, the directors of social welfare propagandas and social agents would be alive to new situations, and would find themselves looking for new ways to handle old problems. The high grade feeble-minded girl would be detected before she were old enough to face for herself the danger of becoming an unmarried mother.

The son who shows signs of early deterioration which mark the progress of the mental disease known as dementia precox, would be noted and chronicled, so that, if examined from period to period, his rate and amount of deterioration would be ascertained. Or, as the study of this disease by scientists and doctors results in an understanding of its causes, and in methods of checking its progress, the young man might, at a fairly early stage, be saved the later course of the development of the disease. This class of mentally disabled, alone, presents tremendous difficulties to any social organization and de-

mands consideration of new ways to be worked with and cared for.

The defective delinquents, not intellectually backward, but morally incapable of keeping themselves out of trouble, or too weak in will power to be made responsible for their own deeds, would be found and classed together as a group to be studied and to be cared for by non-penal public institutions,—institutions which should be adapted to take advantage of the economic value of these delinquents.

The problem of syphilis in the community and its relation to mental disorders would be faced more frankly by medical and social agencies. Some persons do not agree with the policy of the Psychopathic Hospital in requiring the routine Wassermann test, but the importance of the problem and its relation to mental disease demands it. Dr. Southard has said on this subject: "We have. . . an important mission with respect to syphilis. When the patients admitted to a state institution for the insane show positive Wassermann reactions in 22% (H. L. Paine's data, Danvers State Hospital) or, as at times for certain months at the Psychopathic Hospital, from 25 to 28%, it is high time that social workers and economists, as well as physicians, should begin to take an interest in that field of mental hygiene which shall seek coöperation with the sex hygiene propagandists."<sup>14</sup>

That the treatment and study of syphilis is legitimately a state issue is being more and more generally conceded. The appropriation of \$4000 by the Massachusetts State Legislature (April, 1914) to be spent for Wassermann tests by the State Board of Health, is but an indication of the fact that the disease is here recognized as a public menace, to be dealt with by public measure. More data showing the relation between syphilis and mental disorders, would be of great value in a propaganda for the state control of the study, treatment and prevention of the disease.<sup>15</sup>

Routine mental and psychological examinations would, therefore, throw into the limelight of social welfare work the problems of the feeble-minded, the early dementia precox type, the defective delinquent, sufferers from latent syphilis, and the other so-called asocial groups, each so largely represented in mental disorders, and requiring unlimited thought, care, trouble and expense on the part of private and public organizations and institutions. After all, it is the community which bears the brunt of the now unscientific method of dealing with these problems. The income from high rates of taxation now contributes far more to the care of the diseased, delinquent and defective members of the community than to the prevention of the causes of these unfortunates.

A systematic investigation of the mental condition of the chronic dependent, the delinquent, and the asocial members of the community would lead from the more general campaign for social



welfare to a broader and yet more definite campaign for mental welfare. It should in time save money to the taxpayer.

## PART II.

### A SURVEY OF CERTAIN SOCIAL ORGANIZATIONS IN BOSTON SHOWING THE RESULTS OF THEIR USE OF MENTAL TESTS.

To what extent the intensive study of the mental development of an individual should or could be carried by an organization is a much discussed question, and one which calls forth decided differences of opinion.

It was with a desire to gather these opinions, and to determine as far as possible the extent to which organizations working with social problems were already interested in and active with the question, that the following study was undertaken. It was made from the reports of 27 social organizations of Boston and vicinity, and showed some interesting facts relative to the theme of this paper.

In order to secure the necessary data, a questionnaire was sent to seventy-five organizations, chosen at random. The questionnaire covered the work of one fiscal year previous to the summer of 1914. The organizations included social service departments of business houses, private and public child-caring agencies, family rehabilitation and relief agencies, homes for dependent women, settlements and churches, school visitors and nurses. Twenty-seven of these responded. Although this number is small, the 30,410 cases\* enrolled by these organizations, and from which this study was made, should make the figures fairly representative.

Those who did not respond to the questionnaire gave various reasons for their inability to do so. The business houses, as a rule, kept no physical or social records of their employees. This was also true of some churches and their parishioners. A few agencies had not given sufficient thought to their mental problems to note them on their records. Others, who kept careful histories of their cases and dealt with large numbers, were not able to pick out the ones representing psychopathic problems, because their system of recording did not make the year's work readily accessible. Still others had not the time to devote to a special study of this type because it required, in their particular instances, a handling of every record worked on during the year. Some few questioned the value of such a study in proportion to the time and effort demanded of them to secure the necessary data. Many in the groups mentioned also objected strongly to the giving of names, although each organization was assured that the names were wanted only to prevent duplication, and would be destroyed as soon as the reports had been checked with each other.

Several of the 27 agencies which did respond had difficulty in collecting data, and expressed a regret that they had not kept more accurate and more accessible references to their psychopathic problems.

In the spring of 1914, the following form was sent to each of the 75 organizations. The immediate object of the questionnaire was first to ascertain as far as possible the number of mental cases in each agency, and their proportion to the total number of individuals dealt with by each group; and, secondly, to obtain an estimate of the extent to which each agency felt it should have gone in having others under its care examined:

#### QUESTIONNAIRE.

1. What was the total number of individuals dealt with during your past fiscal year?
2. How many were diagnosed epileptic? (Give names.)\*
3. How many were diagnosed insane? (Give names.)
4. How many were diagnosed feeble-minded? (Give names.)
5. How many were examined and diagnosis given of "borderline or doubtful"?
6. Give estimated number of individuals for whom you felt an early examination would have been advisable, but was not given.

The following organizations reported:

1. Boston Associated Charities.
2. Boston Children's Aid Society.
3. Boston Children's Friend Society.
4. Boston Children's Institutions Department.
5. Boston Juvenile Court.
6. Boston Provident Association.
7. Brookline Friendly Society.
8. Cambridge Associated Charities.
9. Catholic Charitable Bureau.<sup>†</sup>
10. Church Home.
11. Filene & Company, Social Service.
12. Florence Crittenton Home.
13. Federated Jewish Charities.
14. House of Mercy.
15. Jamaica Plain Friendly Society.<sup>†</sup>
16. Llewellyn Lodge.
17. Paine Fund.
- 18 and 19. Public School Studies (two)
20. Salvation Army Rescue Home.
21. Society for the Care of Destitute Mothers and Infants.
22. Somerville Associated Charities.
23. South End House.
24. State Infirmary, Social Service.
25. State Minor Wards.
26. Temporary Home, Shawmut Avenue.
27. Waltham Watch Factory, Social Service.<sup>†</sup>

\* Names were not given where there was duplicate duplication, but there was very little overlapping of lists.

† Did not give names.

\* In the seven agencies which dealt largely with family groups, the family is counted as a single case.



That the organizations reporting on the questionnaire represented work of varying extent was indicated by two classifications, one showing the total number of individuals dealt with by each organization during the year, the other showing the type of work done.

Classified according to the numbers which each agency worked with, there were:—

2 organizations dealing with less than	100 cases
8 organizations dealing with from	100 to 250 "
5 " " " "	250 to 500 "
4 " " " "	500 to 1000 "
1 " " " "	1000 to 5000 "
1 organization " " "	6072 "

Nine of these organizations dealt chiefly with family groups, and from seven of them it was not possible to secure the total number of individuals included in the work done. As the reports showed only thirteen defective individuals in families already represented once, these thirteen were thrown out and the percentage of psychopathic individuals for each agency was made upon the basis of the number of cases.

The totals, therefore, showed 984 cases in which at least one individual was insane, epileptic, feeble-minded or borderline. Seventeen per cent. of these 984 persons were diagnosed insane, 10% were epileptic, 53% were feeble-minded and 20% were doubtful or borderline.

In the second classification of agencies there were:

	TOTAL
Family rehabilitation and relief agencies (private)	9
Child-caring agencies { Public 3 } .....	7
{ Private 4 }	
Homes for dependent women { Public 1 } .....	6
{ Private 5 }	
Neighborhood house .....	1
Public school studies made by special students ..	2
Social service in business houses .....	2

From the reports of these agencies, two percentages were made. The first showed the percentage of diagnosed epileptic, insane, feeble-minded and borderline cases (questions 2, 3, 4, 5) in the total number of cases dealt with; the second showed the percentage of such cases in the total number when, to the cases diagnosed, were added the estimate of those persons who, it was thought, should have been examined, but were not (question 6). The second table has no value statistically, except to indicate to a certain extent the feeling on the part of the agents in regard to the importance or value of the use of mental and psychological tests for the asocial persons or those not obviously considered in need of an examination. No effort has been made to use these figures except to report them in the following table, as given.

Judging from the fact that most of the figures were obtained by going rapidly over the records of the year's work, it is highly probable that none of the returns are as full as they would have been had a systematic list of the epileptic insane, feeble-minded, borderline or doubtful

cases been kept by each organization from day to day.

Arranged according to the increasing order of the first percentage made, the organizations gave the following figures. Where no change was made in the estimated number of mental cases, the agencies felt they had secured the examination for all persons who had needed it.

	FIRST PER CENT. DIAGNOSED	SECOND PER CENT. ESTIMATED
Waltham Watch Factory, Social Service .....	% .1	% .1
Filette & Co., Social Service .....	.2	.2
Public School Study .....	.7	4.7
Catholic Charitable Bureau .....	1.3	1.0
Somerville Associated Charities .....	1.1	1.5
Lewiss Lodge .....	1.4	2.2
Public School, Social Service .....	1.5	9.5
Children's Institutions Department .....	1.6	1.6
Boston Provident Association .....	2.0	no estimate
South End House .....	2.0	7.3
Florence Crittenton Home .....	2.2	10.0
Boston Juvenile Court .....	2.3	2.3+
Salvation Army Rescue Home .....	2.5	2.5
Temporary Home, Shawmut Ave. ....	2.7	8.5
Boston Children's Friend Society .....	2.9	2.9
Cambridge Associated Charities .....	3.0	no estimate
Federated Jewish Charities .....	3.1	7.7
Children's Aid Society .....	3.4	3.8
Boston Associated Charities .....	3.8	no estimate
Brookline Friendly Society .....	4.2	25.9
State Minor Wards .....	5.9	6.1
Society for the Care of Destitute Mothers and Infants .....	7.0	16.3
Jamaica Plain Friendly Society .....	7.3	7.3+
Church Home .....	12.7	routine
Palme Fund .....	13.5	18.5
House of Mercy .....	17.9	routine
State Infirmary, Social Service .....	23.0	routine

Considering the types of individuals under the care of these organizations, the foregoing figures seem to fall into four groups.

The first group brings together the employees of one factory and of one general department store, a portion of the population of one neighborhood house district and persons represented by studies from public schools in two economically poor sections of the city. Altogether, they may be considered a cross section of a community with which social agencies of all kinds are concerned. (See Table I.) The total percentage of psychopathic individuals reported in this group is .3% of the given population.

#### TWENTY-SEVEN SOCIAL ORGANIZATIONS.

TABLE I.

##### CROSS SECTION OF COMMUNITY.

Waltham Watch Factory .....	.1% mental cases
Filette & Co. ....	2 " "
Public School Study .....	.7 " "
Public School Study .....	1.5 " "
South End House .....	2.0 " "
Total Mental Cases .....	.3%



## FAMILY REHABILITATION.

Somerville Associated Charities	1.1%	mental cases
Lewisae Lodge.....	1.4	" "
Provident Association.....	2.0	" "
Federated Jewish Charities.....	3.1	" "
Cambridge Associated Charities.....	3.0	" "
Boston Associated Charities.....	3.8	" "
Broadline Friendly.....	4.2	" "
Jamaica Plain Friendly.....	7.3	" "
Paine Fund.....	13.5	" "
Total Mental Cases	3.9%	

## CHILD-CARING AGENCIES.

Catholic Charitable Bureau.....	1.3%	mental cases
Children's Institutions Dept.....	1.6	" "
Juvenile Court.....	2.3	" "
Children's Friend.....	2.9	" "
Children's Aid Society.....	3.4	" "
State Minor Wards.....	5.9	" "
Church Home.....	12.7	" "
Total Mental Cases	4.5%	

## TEMPORARY HOMES FOR WOMEN.

Florence Crittenton.....	2.2%	mental cases
Salvation Army.....	2.5	" "
Temporary Home.....	2.7	" "
Destitute Mothers and Infants.....	7.0	" "
House of Mercy.....	17.9	" "
State Infirmary, Social Service.....	23.0	" "
Total Mental Cases	7.9%	

This population represents a community made up of people who are working for generally small wages. On the whole, they are considered normal,—most of the distinctly abnormal individuals having been placed in institutions. And yet when we compare this .3% with the .5% which represents the total number of insane, epileptic and feeble-minded persons receiving institutional care in the total population for the state of Massachusetts, there is an astonishing similarity in point of average.

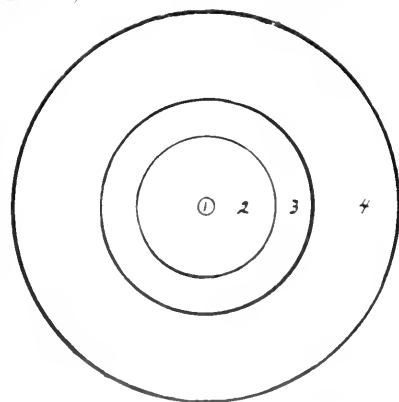
There are two possible explanations for this: first, the actual percentage of the mental cases receiving custodial care is probably far below what it should be. Dr. Fernald's report of the results of an intensive study of the feeble-minded in Massachusetts, which was made following the 1912 census of the State Board of Insanity, states that there are in the community at least five times as many feeble-minded persons needing custodial care as there are those now receiving it. There is also undoubtedly a large proportion of insane and epileptic persons in the community who ought to be given custodial care. As there has been no intensive study made of either the insane or the epileptic in this State, it is impossible to make any estimate which would correspond with Dr. Fernald's study of the feeble-minded.

The second comment is that the community cross section used in this study represents an economically low group of persons. Among them one finds many of the borderline boys and girls, and men and women who are not committable to institutions and are capable of earning the lower wages. In the two public school districts and the neighborhood house district the families represent the struggling masses. We

know that the industrial and professional life of our country is supported to a great extent by men and women coming from the lower economic classes of society, but it is also true that in this stratum there is a large proportion of persons who never rise above it.

Where one finds in this class no improvement from generation to generation, one is apt to find a low grade of mentality as well as physical, mental and moral disease in varying degrees. It might, therefore, be expected that here one would find a large number of the insane, epileptic, and feeble-minded. It is in this economic stratum that most of the cases known to the other twenty-two social agencies are found.<sup>18</sup> It seems fair, therefore, to compare the percentages of the three following groups with this chosen cross section of the community.

The first group for comparison is made up of agencies caring chiefly for families and undertaking family rehabilitation. It shows that 3% of the persons known to them have been diagnosed as psychopathic. The second group is made of agencies caring for dependent and delinquent children and has 4.5% of mental cases. The third group includes the Temporary Homes for Women and agencies dealing with unmarried mothers. Here there is a distinct rise found in their 7.9% of mental cases. (See Chart I.)



Returning to the detail of the last three groups, it will be seen that in the Family Rehabilitation and Relief Association the percentages range as follows:



	PSYCHOPATHIC
Somerville Associated Charities.....	1.1%
Bedford Home for Women.....	1.4
Provident Association.....	2.0
Federated Jewish Charities.....	3.1
Cambridge Associated Charities.....	3.0
Boston Associated Charities.....	3.8
Brookline Friendly.....	4.2
Jamaica Plain Friendly.....	7.3
Paine Fund.....	13.5

The sharp increase found in the 13.5% of the Paine Fund may be accounted for in part by the fact that a large percentage of the individuals aided by that fund are those who have passed middle age without having been able to provide the means of livelihood for the later years of their life. There are many aged persons who are dependent through no fault of their own, but they are entirely outside of the group of those whose histories show indigence and delinquencies. The Paine Fund cares largely for dependent single persons, and for married ones who are without relatives to help them. The secretary of the society has but a comparatively small number of applicants during the year, so that it is possible for her to work in close coöperation with the medical agencies and give her applicants very personal attention.

As a whole, the family group of organizations has a surprisingly low percentage of insane, epileptic and feeble-minded.

One is inclined to feel that families which must be aided and supervised from year to year and are unable to rise above the need of it within the course of two or three years—as a portion of them are not—must be, to a great extent, handicapped by a subnormal or diseased mind. It would be worth while with this group of family rehabilitation agencies, to make an intensive study of the 343 families in which this report finds diagnosed 343 psychopathic individuals. It is significant to note just here that from all of the figures sent in for this study, there were only 13 other mental patients reported as belonging to these 343 families. This would indicate that either the data were incorrectly recorded or that other members of families in which there are mental patients are not being recognized.

An intensive study of these 343 families should ascertain the number of years each has been under the care of a social agency, the kind and amount of aid given, and the results secured in proportion to the time and money spent after a stated number of years. It should also determine the number of other members in the family showing signs of disease or defect. This information is evidently important in studying the group of psychopathic persons already recognized. Is it not also important to look into the mental condition of the members of those other families which drift along from year to year, apparently content with gaining mere sustenance, getting out of difficulties, and ending

their days supported by some fund or by a private or state institution?

Both state and private institutions would contribute toward the improvement of the community at large, as well as to the efficiency of their own work, if it were possible at an early stage in the history of these families, to obtain their mental status.

It is not at all surprising that the total number of mental cases in this family rehabilitation group is 3% of the whole, as compared with the 3% mental cases of the cross section, representing the community in which most of them are found. On the other hand, if for one year these family rehabilitation agencies were to catalogue or signal every individual with mental disease or defect known to them during that time, and if they were to make a greater effort to have examined more of their eccentric applicants and those offering particularly difficult problems, it is quite probable that the total number of mental cases would increase in percentage. The present figures are of value only as a basis for comparison in a further study.

The child-caring group as here given includes the organizations responsible for delinquent children, as well as those caring for dependent children. This at first seemed to be a doubtfully fair grouping, but inquiry brought out the fact that most of the agencies caring for dependent children were attempting close coöperation with the Juvenile Court, and were boarding out and supervising many children for whom the court had advised a change of environment. Some children in the care of these agencies had also acquired court records, so that they were already classified among the delinquent. The problems, therefore, of the agencies dealing with the dependent and the delinquent children seemed closely enough related to warrant their being classified together in this study. Seven agencies reported their mental cases as follows (all duplicate names have been eliminated):

	MENTAL CASES
Catholic Charitable Bureau.....	1. %
Children's Institutions Dept.....	1.6
Boston Juvenile Court.....	2.3
Children's Friend Society.....	2.9
Children's Aid Society.....	3.4
State Minor Wards.....	5.9
Church Home.....	12.7

The total percentage of mental cases for this group is 4.5. Five of these agencies already attempt to have physical examinations for their children before any responsibility is assumed, but they are not given as routine. The State Minor Wards has its own physician, and has every child examined before accepted for its care. They had under supervision during the year reported on 6072 children, 361 of whom were feeble-minded, epileptic, insane or borderline. The State felt the need for the physical examination of these children, and the means for providing it was found. The psychological examination will be more uniformly used, and equip



ment for it will be provided, as agencies like the State Minor Wards feel the need for psychological as well as physical examinations.

In the work for children there are two reasons for establishing the mental status of each child. First, to detect the feeble-minded and subnormal; the value of this is obvious. The second is to be able to record a definite mental rating for the normal child in order that future mental tests, over periods of perhaps five years, may show whether the patient is developing normally, or is deteriorating. Most of the dependent children have a poor heredity, and even though unusually bright in childhood, may, during adolescence, show arrested development or a beginning psychosis.

In order to make a diagnosis of a beginning psychosis in a child, it is important to know whether or not he has deteriorated, and if so, at what age the deterioration appeared, and along what lines. With the inevitable frequent changing of supervising agents, this information cannot be obtained accurately from social records. The routine use of standardized psychological tests offers the only scientific method for acquiring this part of the history of a child.

The 4.5% representing the total percentage of mental cases reported by these child-caring agencies shows an increase over the 3% mental cases reported by the family rehabilitation agencies. This does not at all signify that there is a larger amount of mental disease and defect found in groups of children than in the social groups, including children and adults. It is rather more probable that the child-caring agencies have been able to secure an examination for a larger proportion of their cases than the family rehabilitation agencies have secured. It is quite natural that this should be so, since the children's agencies have far greater control over the children under their care than any of the family rehabilitation or relief agencies have over their applicants. In comparison with the .3% mental cases in the community cross section, it is, however, important to note that so large a percentage as 4.5 defective and mentally diseased children should be found among these special children's agencies.

An analysis of the percentages of the seven agencies calls forth further comment. The first six percentages range from 1% to 5.9% mental cases, while their total percentage is 2.8. On the other hand, the Church Home, which is the seventh agency in the group, stands by itself with 12.7% mental cases, in spite of its endeavor to raise its standard for the type of child taken under its care. It is probably significant that during five months of the year reported on, the Church Home secured a mental and physical examination for every new child accepted for care of any kind. This would seem to indicate that we are not in a position to estimate the number of defective and insane children without a more

extensive use of psychological and physical examinations.

The last group of agencies, and perhaps the one most urgently in need of a systematically intensive study of mental conditions, includes those agencies helping stranded women of various types. Conspicuous among these women are the many unmarried mothers. Some of the child-caring agencies are making an effort to supervise, outside of institutions, certain of these mothers, but the temporary homes still are necessary for some purposes. Unfortunately, we have not been able to secure figures from those child-caring agencies which have recently undertaken the boarding-out phase of this work. The following reports are from temporary homes (with one exception). Arranged according to the percentage of women diagnosed psychopathic, the reports show:

#### MENTAL CASES

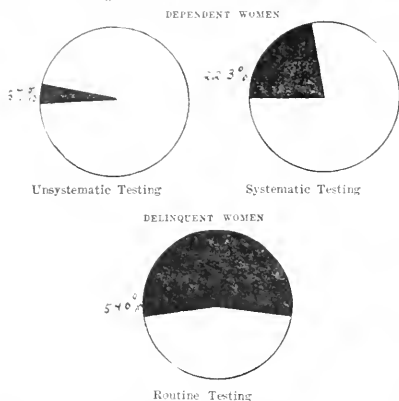
Florence Crittenton Home .....	2.2%
Salvation Army Rescue Home.....	2.5
Temporary Home for Working Women .....	2.7
Destitute Mothers and Infants.....	7.0
House of Mercy.....	17.9
State Infirmary, Social Service.....	23.0

The total per cent. is 7.9, but a closer analysis is important. The first three institutions have a striking similarity in the number of mental cases they have detected, the number being indicated by 2.5% of the total number of persons worked with. In each of these homes the supervisor is interested in the girls under her care, and is anxious to secure an examination for those who are not thought to be normal. On the other hand, the Society for Helping Destitute Mothers and Infants, which places many unmarried mothers at work and in boarding homes, and bases its treatment upon investigation and observation, shows an increase of over 4% of psychopathic women. It is hardly possible that this agency has under its care a lower type of woman than that which usually seeks shelter in an institution. But a still more striking rise in percentage is found in the average of the two institutions dealing almost entirely with unmarried mothers, namely, the House of Mercy and the State Infirmary (Social Service), both of which have endeavored to make a systematic study of the mental condition of those in their care, no matter what the circumstances of the mother's life may have been. The 22.3% average of these two institutions would indicate surprising returns from the systematic use of mental tests.

The foregoing are the figures, however, for the unmarried mothers, who are, for various reasons, dependent but not necessarily delinquent, to any great extent. It is, however, interesting at this point, to note from the Massachusetts Commission for the Investigation of the White Slave Traffic in 1911, that in a series of 100 women prisoners, 13500 from prisons, another 100 from detention homes, and a third



MENTAL CASES FOUND IN AGENCIES DEALING WITH ILEGITIMACY. Classified according to the extent to which mental tests were used.



Results of a study of 300 prostitutes by the White Slave Commission.

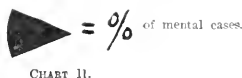


CHART II.

from industrial schools, 51% of them were found to be feeble-minded and 3% were insane, making a total of 54% psychopathic. (See Chart II.)

That there should be 7.9% total mental cases found in these Temporary Homes for Women is not at all surprising; rather, one might expect to find a much higher percentage of the defective or mentally diseased in a group in which the unmarried mother forms so large a part. One does not condemn all unfortunate women as necessarily insane or feeble-minded, but figures are pointing out more and more clearly that mothers with illegitimate children who become dependent or are brought before the courts, include enough feeble-minded and insane among them to make further systematic inquiry important.

In conjunction with the study of these four groups, it is interesting to analyze the figures in such a way as will show comparative relations depending upon the different technic employed by the four groups of agencies.

With respect to their manner of selecting patients for examination, these twenty-seven organizations fall into three classes, namely: (1) those who have persons examined only when the disease is obvious; (2) those who base the need for an examination upon a suggestive history including heredity, conduct and general physical symptoms, in part or all together; and (3) those who believe in a routine mental examination for every individual under their care, but for various reasons have been able to secure it for but a given portion. This last class of agencies may be designated as those who have systematically used the mental tests.

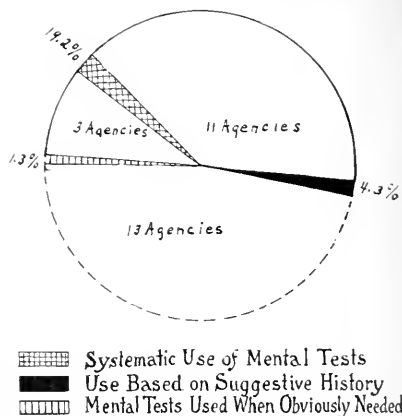


CHART III.

A STUDY IN TECHNIC. THREE GROUPS IN THE STUDY OF TWENTY-SEVEN SOCIAL AGENCIES.

The extent of their use of mental tests and the respective results as represented by the percentage of mental cases found in each group.

There were thirteen of these agencies who made use of special examinations only when the defect was obvious. (See Chart III.) Their total per cent. of psychopathic cases was 1.3%. There were eleven agencies who based their use of special examination upon any history of their charges which suggested the need for examination, and their total mental cases amounted to 4.3% of their whole number dealt with. There were just three agencies attempting to make a systematic inquiry into the mental status of their charges, and the result of this effort showed 19.2% of their charges to be psychopathic. Two of these three agencies dealt with unmarried mothers, and one cared for dependent children.

Applying this same method of classification to the Temporary Home group, which is characterized so largely by its problem of illegitimacy, and comparing the total percentages of its three classes with those of the same three classes for the whole twenty-seven agencies as given above, we have what appears to be a closely corresponding increase in percentages, depending upon the method of selecting patients for examination. (See Chart IV.) In the Temporary Home group, examining for obvious defect, the percentage of mental cases is 2.5% as compared with the 1.3% for this class in the whole group. The Temporary Home group has 7% mental cases in the agency basing its use of special examinations upon the suggestive history of the patient, as compared with 4.3% mental cases for the whole group of agencies. Again, the Temporary Home has 22.3% mental cases in the agencies making a systematic use of the mental tests as compared with 19.2% mental cases in the corresponding class for all the agencies.



A COMPARISON OF I AND II, BASED ON THE USE OF MENTAL TESTS.  
BY I.

SIX AGENCIES DEALING WITH ILLEGITIMACY



BY II.  
TWENTY-SEVEN SOCIAL AGENCIES STUDIED

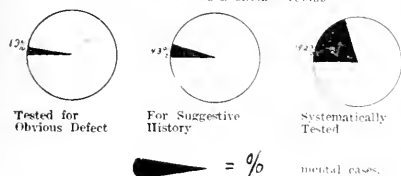


CHART IV.

Just how significant this analogy is can be determined only by a further study of these agencies and the results of their uses of mental tests.

### PART III.

#### CONCERNING THE USE OF ROUTINE PSYCHOLOGICAL EXAMINATIONS FOR CERTAIN AGENCIES.

We have not yet come to the era when all persons shall be ranked by society upon an efficiency basis,—when the stagnant men and women, the non-producers, whether rich or poor, shall be looked upon as one and the same, socially as well as economically, or when the ability of men and women shall be gauged by methods which will approach a uniform standard. The day may come, but until that time the public is particularly concerned with the mental status of those members of the community who, because of mental, moral or physical weakness, or because they are unable financially to care for themselves, are costing the State and private organizations large sums of money and much thought and work.

For the public and private agencies dealing with dependency, delinquency, child-caring and illegitimacy problems, the use of a routine mental and psychological examination, combined with the physical examination and Wassermann test for syphilis, seems to be the most direct means of finding the primary causes of their problems.

Directors, physicians and psychologists in psychopathic hospitals and psychological clinics are persistently considering and testing practical and fair methods for rating the mental status of the patient. It is their endeavor to make the application of the tests advantageous to the work of the various organizations employing the clinic, quite as much as that they

should have the results of the tests as a basis for study and improvement.

In order to get the opinion of the representatives of social agencies in regard to the possible benefit to be derived from a routine use of mental tests, a second letter was sent to each of the twenty-seven agencies which responded to the first questionnaire. Opinions were expressed in favor of and against such a system. A few of their replies are quoted in part.

Some of the child-caring agencies wrote as follows: "Children in our care are under such close supervision that when the need for mental examination exists the visitor is prompt to discover it, and the examination may then take place." Another wrote: "Such an examination would give rise to serious objection on the part of the public at large, especially the parents and guardians of the children."

Still another said: "For patients who have indicated no mental instability in their past lives, the examination produces a state of mind which very much affects the social treatment. This applies to children, as well as to unmarried mothers."

One agency, which has been urging a central medical examining agency to which all might send their children, says, "The more I consider the administrative side of such a central agency, the more do I sense the dangers there are in having the personality of the individual more or less lost in a large group of others who are being examined. Under the present methods of examination of children, I have felt that the conditions were neither normal nor fair to them. I wish it were possible to have all the patients meet the physicians in so informal a way as not to give them the slightest indication of what was being done."

Another agency, dealing with 100 children in a year, thought the problem would be too big for the present psychological clinics, and to employ its own alienist would be too expensive. It suggested that, as a matter of economy and practical social administration, we should have to be content at present with eliminating from these examinations all children who are practically up to grade in school, and have not shown themselves to be unusually troublesome or obviously peculiar.

One of the agencies which has advocated and tried a systematic use of mental and psychological tests, writes that: "A routine mental and psychological examination is of great value in connection with the various problems of child-caring and allied subjects, provided it is done from the point of view of the society and with a social outlook. Such an examination, to be valuable to us, must have a practical significance, and must be done with the same social point of view that we require in a physical examination. To be helpful in placing the results of the examination must be obtainable within a short time of the examination, and



should include definite recommendations as to ideal surroundings, just as, again, the good physical examination carries with it recommendations as to hygiene, etc."

From those agencies caring for unmarried mothers one wrote: "Such an examination would be both helpful and interesting, but not possible under our present administration because of lack of time and workers." Another believed that in all cases where there was any question of doubt about the mental condition of the mother, or where her future disposition presents some difficult problem, the examination would be of great assistance; in others it would be an unnecessary ordeal. A third wrote: "So far as our work with unmarried mothers is concerned, I believe that mental and psychological examinations should be made in every case."

From the family rehabilitation and relief agencies there were more dubious opinions. One wrote: "So far as including a routine mental examination for all dependent families and the out-door poor, I am not so certain. Many should undoubtedly be examined. Whether all or not, I should want to think longer before answering. Of course, our charges, from the children to the aged, offer rich material for psychopathic study. Present facilities make it impossible to identify all of the mentally disordered cases which we handle."

Another mentioned the difficulty in having a family which appeared perfectly normal in every respect, submit to an examination, and felt it would be embarrassing to have all families examined.

One other felt that privately supported family rehabilitation agencies could not take advantage of the use of mental tests generally until the public, which supported the agencies, demanded its use.

A critic in close touch with the family rehabilitation agencies said: "I find myself wondering whether the very compactness and air of finality that belongs to a mathematical rating should not make us more cautious in recommending its use for all, or nearly all, clients of social agencies."

"A possible and safer next step on the long road that we have to travel would be the instruction of educators and social workers in the signs embedded in personal and family history and in the symptoms presented by the individual himself, which would indicate the possible need of a mental examination."

From these comments it is evident that the practical need for a better appreciation of the mental status of social clients is already felt to a limited extent. It is undoubtedly but a matter of time, and the education of public opinion before the use of psychological and mental examinations will be established as a necessity in the program of every social agency undertaking the supervision of delinquents, dependent chil-

dren, chronically dependent adults and women with illegitimate children.

Stated briefly, the most important objections to the routine use of mental tests are as follows:

1. There is too great difficulty in securing the mental, as well as the physical, examination of large numbers of social patients. This objection is resolved into three parts: (a) Where agencies do not have their own psychiatrist there is the difficulty of getting adult patients to go voluntarily to a clinic which suggests possibility of mental trouble in patient. (b) The clinics at present are not equipped to handle large numbers. (c) The public does not yet appreciate the value of such a proceeding.

2. Many social workers feel there is danger in relying too greatly upon the results of the psychological tests, which in their minds are not far past the experimental stage.

3. The expense of maintaining a psychiatrist or psychologist is too great for the average social agency, and there is danger of lowering the general standard of psychiatric work where individual psychiatrists are employed.

4. Social workers should have more knowledge of psychopathic symptoms and problems in order to make proper use of the results of such examinations.

5. The other objections fall under the head of criticisms of administration.

The first objection is found most evident among the family rehabilitation and relief agencies dealing with the chronically dependent adult. In these agencies it is true that the applicants are largely referred by privately philanthropic persons, and an effort to get these applicants voluntarily to a psychopathic hospital is usually fruitless. It is here also that the public, among whom are these privately philanthropic persons who referred the applicants, will be most quickly aroused to harsh criticism of the agencies' methods. Their untrained sympathies so often resent any appearance of red tape. If, however, the public could see the importance of knowing the applicant's mental status, a satisfactory technic would undoubtedly be worked out. For example, all family rehabilitation and relief agencies must always do a certain amount of emergency or temporary work in order to prevent the possibility of suffering, and acute problems would not, therefore, be hampered by routine. But where constructive work for families or individuals is undertaken, and financial assistance is offered to cover a protracted period of time, a routine system of examination would facilitate treatment greatly, not only because of its assistance to the social worker in making a well grounded plan, but also because the applicant would not be inclined to resist an examination which would be required of all under similar circumstances. The sting of being singled out as "peculiar" would be removed. One research worker has suggested that a beginning be made by securing systematically a physical



and mental, or psychological, examination for the members of any family which has not been able to establish its social independence within two years. The time element, of course, would not be significant with those families for whom an adequate pension and supervision over several years has been planned by an agency,—in such families, for example, as those of widows, of certain deserted wives, and those in which the breadwinner suffers from an incurable disease. But with these latter families, as previously suggested, one should have a knowledge of the mental and physical condition before determining the plan for their future.

With the children's agencies, the difficulty in securing mental tests lies chiefly in the proper handling of large numbers. The State Minor Wards, for example, had 6072 children under their care during the year reported on. If this agency had begun with the 850 children, whom they received during that year, there would not have been more than three patients a day to be examined. A complete psychological examination, including the Point Scale, the Binet and Healy tests, seldom takes over two and a half hours.

The agencies dealing with unmarried mothers would also obviate their great difficulty in getting the patient to the clinic if the tests were given as routine.

That the clinics are not yet prepared to examine as many patients as such general use of mental tests would necessitate, may be true, but the inevitable law of supply and demand would regulate this. Not only would the present clinics be better equipped, but new clinics would be opened.

The second objection—the danger of relying too greatly upon the ratings of the psychological tests and the distrust expressed as to the practical value of these tests in their present stage of development—is one that is often heard from social workers. It is, however, ungrounded except where unwarranted claims have been made for the tests. When used by skilled psychologists, the results of the examination have definite values, and lend themselves to practical interpretations. The special worth of each method of examining should be known, and it is usually advisable to combine two or three different methods of testing in order to check the results.

The third objection—the expense involved—should an agency employ its own psychiatrist and develop an independent small clinic of its own—is one which can be met only by the education of the public which supports these agencies. Four of these twenty-seven organizations already have an examining physician in their employ, and for them it would be necessary only to add a psychologist, and the usual psychological equipment. Both the physician and the psychologist should have had experience in a psychopathic hospital or a psychological clinic.

Social histories are already obtained and required by most social agencies, and if, in addition to the physical and mental examinations, arrangements were made for the taking of the Wassermann test on every case possible, the individual clinic would meet the needs of the average applicant, and could decide which individuals should be sent to a psychopathic hospital for observation and more thorough study.

By eliminating the less difficult cases of these agencies in this way, the demand upon the hospitals would be diminished. With such a system, agencies which assume the care of children or individuals over a period of years would have the means of making careful records of the mental improvement or deterioration of those under their care during the time known to them. An examination should be given at intervals of at least three years, but if the individual is supervised for less time, the examination should be given at least upon his admission and discharge.

The work of giving mental and psychological examinations should not be entrusted to social or eugenic workers, unless they have had, as a background, special training as physician or psychologist. The mere formality of subjecting a patient to a Binet or other mental examination will not meet the need which this paper has attempted to point out. Physicians and psychologists employed by social agencies as independent examiners should endeavor to standardize their work by securing as nearly uniform data as possible, and should have some means of interchange and discussion of methods and results.

The fourth difficulty, found in the lack of knowledge of psychopathic problems on the part of the social workers, is one that is generally felt. It is not only acknowledged by social workers, in their inability satisfactorily to select patients for examination, but also in the difficulty which they find in dealing with the non-committable psychopath. That social service departments of psychopathic clinics should undertake to supervise all of these non-committable cases, especially where another agency has already established friendly relations, is impractical. But that social workers in training should have certain courses on psychopathic problems and a required amount of practical experience in a psychopathic hospital or clinic, is undoubtedly the final solution of the difficulty.

Objections to the administration of the clinic such as complaints made of the manner of approaching the subject of examination to a patient, etc., may be based on exceptional instances. Mistakes would be corrected, if reported to the proper authority.

Aside from the special study of their charges from the mental point of view, social agencies should develop a system of indexing their psychopathic patients so that, whether using rou-



tine examination or not, these patients could be readily referred to. Certain social organizations find it expedient to keep an index of the community problems which appear from day to day in their case work.<sup>17</sup> For example, those families under their care in which there is found disability from industrial accident are indexed in a section so named. Other index headings include child labor under fourteen, dependent widows, blindness, illegitimacy, and various problems of current interest. In such an index there should be introduced a section for the insane, the feeble-minded and the epileptic, and a fourth one entitled, "Other types of nervous instability." This fourth group of nervous patients would include those social patients commonly referred to as "queer" and "particularly troublesome and difficult to work with" as well as those whose social history suggested mental disorder or defect, but whose examination resulted in a diagnosis of "not insane" or "not feeble-minded" at the particular time stated.

The social organizations making use of such an index have found a particularly effective use for it in their publicity work and in the preparation of special leaflets and pamphlet studies, preparation of annual reports, legislative campaigns, provision of data for commissions and social investigations, as well as for the intelligent supervision of their own work.

The agencies which will so index their mental patients will be ready with valuable material for the propagandists and students of mental diseases. They will also be taking a first step toward the establishment of a larger institution, namely, state registration of all insane, feeble-minded and epileptic.

Without a systematic study of their charges, with an eye to identifying those with mental disorders, the organizations giving relief, readjusting home and industrial conditions, promoting prophylactic measure, or caring for the welfare of the child, cannot estimate the part which the psychopathic patients play in their respective problems. Whether or not a patient is committable to an institution is not the all-important question for the community. How to deal with those patients who are not committable—most of whom must return to their former friends and helpers—should interest each organization even more than the weeding out of the committable ones.

#### RECOMMENDATIONS.

1. A way should be provided by which all social workers in training should be given instruction in the social and general signs of mental diseases. This instruction should include experience in work with psychopathic patients.

2. Social organizations of every type should keep an index, either by signal or card catalogue, of the insane, epileptic, feeble-minded and distinctly asocial persons enrolled.

3. There should be developed a central bureau of registration for persons included in the above four types.

4. All agencies dealing with unmarried mothers, delinquents and dependent children, should establish as an essential routine a careful physical and mental examination of every individual under their care.

5. Agencies dealing with dependents who are not delinquents should establish as part of their necessary routine a system by which families or individuals dependent for more than two years, or families for whom an agency is planning to give considerable aid and supervision, shall be given a thorough physical and mental examination as early in the treatment as possible.

6. All children in the care of social agencies, whether normal or borderline, should be given mental examination upon admission and discharge, and if supervised for several years should be examined at intervals of from three to five years.

7. The existing psychiatric clinics and psychopathic hospitals should be enlarged and equipped to meet the increasing demands made upon them.

8. When these centers can no longer care for the patients, other psychological clinics and psychopathic hospitals should be supplied.

9. Should social agencies prefer to employ their own psychologists or alienists, these specialists should work together in such a way that their work would be standardized and the data be as nearly uniform as possible.

10. All psychological or mental examinations should include the Wassermann test for syphilis, as well as a physical examination and social history.

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## Clinical Department.

### MULTIPLE PRIMARY HETEROGENEOUS TUMORS: A CASE OF TWO PRIMARY MALIGNANT TUMORS, ONE OF THE KIDNEY, THE OTHER OF THE STOMACH, WITH METASTASES FROM EACH IN THE LIVER.

By STUART GRAVES, M.D., LOUISVILLE.

[From the Pathological Laboratory of the Boston City Hospital.]

An autopsy which revealed a typical hypernephroma or adrenal cell carcinoma of the left kidney and a typical adenocarcinoma of the stomach, each with metastases in the liver, prompted a study of the subject of multiple primary tumors and a review of the literature on that subject. There are many articles, a perusal of which brings out the following facts: (1) multiple benign primary tumors, especially homogeneous neoplasms, such as leiomyomata, lipomata, etc., are common; (2) combinations of malignant and benign growths of different cell origin, such as carcinoma of the mammary gland and leiomyoma of the uterus, are not uncommon; (3) multiple primary malignant growths of homogeneous nature, such as bilateral carcinoma of the mammary glands or bilateral hypernephroma of both kidneys, are less common than (2); (4) multiple primary, malignant, heterogeneous tumors, such as in the case herein reported, are extremely rare. The last class might be subdivided into two; (a) epiblastic (carcinomatous) growths affecting different systems with different forms of new growth, such as carcinoma of mammary gland and carcinoma of colon, and (b) multiple primary, malignant growths of different embryonic cell origin, such as epithelioblastic and fibroblastic. Of the two subdivisions, the second is probably the rarest of all.

In the laboratory of the Boston City Hospital no case of multiple primary, malignant, heterogeneous tumors beside the one submitted in this report, has been found in 4586 autopsies. Three other cases have shown multiple primary, heterogeneous tumors. For example, one case (04.41), female, death from bronchopneumonia, showed adenoma of left adrenal gland, leiomyoma of uterus, fibroma of ovary, rapidly growing leiomyoma of broad ligament, adenomas of liver and so-called cavernomas of liver. Another case (05.150), male, 51, death from rupture of esophageal vein, secondary to cirrhosis of liver, showed carcinoma of colon, papillary adrenal tumor of kidney with adenoma of kidney. A third (16.71) showed carcinoma of the pancreas with metastases into the retroperitoneal lymph nodes, intestines and bladder wall; also papillary adenoma of the right kidney about 5 cm. in diameter, apparently benign. It is seen that none of these cases showed clean-cut malignancy with metastases of tumors of a different cell type arising in different systems. In examining the reports of similar cases the same fact is striking,—that multiple, primary tumors of proved malignancy, either of the same embryonic cell type in different systems, or of different embryonic cell types, are extremely rare. This case to be reported is also unusually interesting in showing direct extension of the tumor along the venous system. The record is in part as follows:

C. F. H. Male, white, 64 years old. The emaciated condition and slight yellow tinge of the whole body is striking. Superficial veins are everywhere dilated, standing out prominently on the abdomen. Lower ribs are everted. Just below the xiphoid there is a moderate bulging 6 cm. in diameter.

*Peritoneal Cavity.* In the upper left quadrant is a retroperitoneal mass over which lie dilated veins and the beginning of the descending colon. The bulging seen externally below the xiphoid is due to a tumor mass in the liver. The lymph nodes in the omentum and mesentery are slightly enlarged, largest 15 mm. in diameter, firm and on section pale grey and granular.

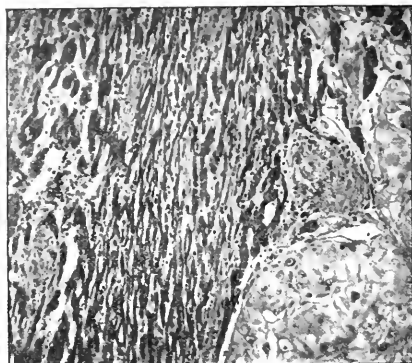
*Lungs.* In the left lower lobe is found a tumor nodular 1 cm. in diameter, firm, grey and granular.

*Gastrointestinal Tract.* The portion of the stomach which lies against the under surface of the left lobe of the liver on opening shows an irregular, cauliflower-like, thickened area 6 x 7 cm., which begins 2 cm. from the cardiac opening and measures from 5 to 13 mm. in thickness. Cut surface of this is hard and grey and the mucous surface shows ulcerating patches. Its color varies from pale to rosyish grey and dark red. A scarlet through this area into the liver shows a clearly cut differentiation along the peritoneal surface of the stomach for the most part, but in one place where the tumor is located the ulceration extends with tumor mass into the liver 25 mm.

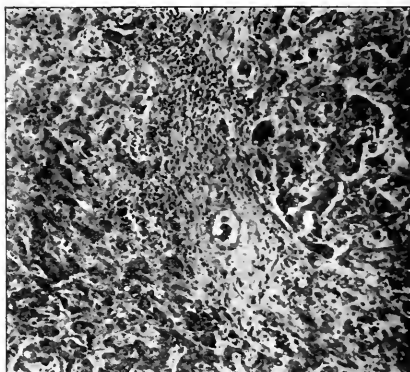
*Pancreas.* The pancreas is diffusely affected in its proximal portion with the tumor nodules described above.

*Uterus.* White, 18 x 10 x 10 cm. (with dilated gall bladder and small portion of stomach attached).





HYPERNEPHROMA METASTATIC IN LIVER. X200.



ADENOCARCINOMA METASTATIC IN LIVER. X200

Organ presents multiple nodular masses, the largest of which is about 10 cm. in diameter. On section this shows a cleanly circumscribed tumor, about the periphery of which is a grey line. The tumor is soft and almost spongy. The cut surface varies from pale grey, most marked about the periphery, to dark red through the greater central portion. About the tumor mass liver cells seem compressed and the cut surface of the liver tissue is speckled with fine brown dots. Cut surface of tumor bleeds freely. There are numerous other tumor masses, some of which are not more than 5 mm. in diameter. Some of them appear to be blood vessels filled with tumor tissue.

**Kidneys.** Weight, right, 125 gms. It is small, firm and pale. The capsule is adherent and leaves a finely granular surface when pulled away, in which are a few small cysts. The cut surface shows indistinct markings, but the Malpighian bodies are visible as fine grey dots. Cortex, 10 mm. Cut surface is pale.

Left kidney is replaced entirely by a tumor mass 11 x 12 x 21 cm. Weight, 1910 gms. It is roughly of kidney shape. Its color is pale grey and yellow with red areas. The mass is extremely boggy. On section the cut surface varies in color from ochre to deep reddish brown, and is separated into large lobules by coarse strands of pale grey, depressed tissue. From the darker portions blood runs freely. The tumor tissue in places is coarsely granular and extremely friable. In the yellower portions there are mixed in places, indistinct, interlacing, irregular areas of pale, opaque, firm, colorless tissue.

**Adrenals.** The left adrenal is found on one side near the upper pole and, while closely attached to the tumor mass, shows nothing remarkable in itself. Right adrenal not remarkable.

**Note:**—The remarkable feature of the gross picture is the distention of the left renal vein and inferior vena cava with what appears to be tumor tissue consisting of a spongy, dark red and grey mass sharply defined by the vessel walls. Each vessel seems filled with its mass.

#### MICROSCOPIC EXAMINATION.

**Tumor of Left Kidney.** Sections show a very cellular new growth with very little stroma and many

capillaries, scattered through which are more or less extensive areas of necrosis and hemorrhage. The type cell is irregularly polygonal for the most part, but some cells tend to be round or polymorphous, or, in more cellular areas, spindle shaped. These cells vary greatly in size, some being very large. The nucleus of the tumor cells is round or oval, pale, vesicular, usually centrally placed, and has one or two distinct nucleoli. Some nuclei are hyaline. The cell membrane is distinct and the cytoplasm is scanty, faint pink and finely granular, the combination giving the tumor a reticular appearance. Some multinucleated cells are seen but no mitoses. Many tumor cells are filled with fine vacuoles, which correspond to fine fat globules in Scharlach R. stain. Other tumor cells contain dark greenish brown granular pigment, in small masses in the larger cells and filling the smaller cells. This pigment is seen more where the tumor is more cellular and less differentiated. The cells resemble adrenal cells. Although the stroma is fine and scarce, there are some broad, fibrous bands which are infiltrated with lymphocytes. The capillaries have very thin walls. In many places the tumor cells are arranged about cavities in which disintegrating tumor cells and many endothelial leucocytes filled with fine vacuoles are scattered through serum and erythrocytes. Some cavities contain masses of necrotic cells; others, serum only or red blood corpuscles only. There are also extensive areas of hemorrhage with scattered endothelial leucocytes containing greenish pigment granules. One kidney tubule seen. Microscopic diagnosis: adrenal cell carcinoma (hypernephroma).

**Lungs.** Section from base of left lung shows a circular area of tumor similar to the tumor of the left kidney, but with more stroma, growing expansively and compressing the alveoli of the lung about it. Microscopic diagnosis: metastatic hypernephroma.

**Stomach.** One section shows a spot in the mucosa where the epithelium is atypically arranged, tending to form small masses or glands with one layer of epithelium. Both cytoplasm and nuclei of these cells stain more deeply than in the corresponding cells of the neighboring mucosa. Numerous mitoses seen. Some of the masses are dilated into small cavities, some of which contain mucoid material. These glands and small masses of epithe-



lial cells at one point infiltrate the muscularis and muscle coat. Both normal mucosa and tumor are infiltrated with polymorphonuclear leucocytes, for which many tumor cells are phagocytic. Microscopic diagnosis: adenocarcinoma.

**Stomach and Liver.** One section shows the adenocarcinoma extending directly from the stomach into the liver, compressing liver cells before it. In the stomach wall some cords of epithelium lie in lymph spaces and fewer masses of epithelial cells in lymph vessels. The cells in the edge of the compressed liver are more or less degenerated and infiltrated with leucocytes, among which polymorphonuclear and endothelial leucocytes predominate. In the cytoplasm of a few are fine red, crystalline particles. In the stroma are many lymphocytes and endothelial leucocytes, containing pigment resembling hemosiderin. The more normal liver beyond shows congestion and some lymphocytic infiltration of the connective tissue. The surface of the tumor shows extensive areas of necrosis with masses of coeci, bacilli and thread-like organisms. Around the necrosis and infiltration of the tumor are many endothelial leucocytes, some phagocytic. Some of the tumor cells are phagocytic for leucocytes. Microscopic diagnosis: adenocarcinoma of stomach extending directly into liver.

**Liver and Inferior Vena Cava.** Sections show tumor similar to that of the left kidney, separated from the liver by a wall of vein to which it is attached along the greater portion of the line of contact. There are intervals along this line where spaces lined with endothelium contain erythrocytes, as if the lumen of the vein were not entirely occluded by tumor.

**Liver.** Various sections show tumor of both types described. In one section a growth of adrenal cell type is entirely surrounded by liver tissue. Microscopic diagnosis: metastatic carcinoma of both types described.

**Left Adrenal.** Section shows the greater portion of one half occupied with tumor mass resembling that of the left kidney. The tumor is surrounded by a narrow rim of cortical adrenal cells except at one point, where only the capsule intervenes between it and similar circumscribed tumor masses outside. One smaller, similar new growth is seen in either end. Part of the capsule is infiltrated with lymphocytes and contains a considerable number of cells with yellowish brown pigment. Microscopic diagnosis: metastatic carcinoma of adrenal cell type.

**Mesenteric Node.** Lymph spaces invaded with masses of epithelial cells with deeply staining nuclei and basic staining cytoplasm; mitoses frequent. Some masses inclose polymorphonuclear leucocytes. Many masses show necrosis, some having only stroma left. Microscopic diagnosis: metastatic adenocarcinoma.

#### FINAL DIAGNOSES.

Hypernephroma (adrenal cell carcinoma) of left kidney with metastasis in liver; adenocarcinoma of stomach with metastasis in liver and mesenteric node; hypernephroma of left adrenal; hypernephroma in inferior vena cava; bronchopneumonia; healed nephritis of right kidney; sclerosis of aortic valve, coronaries and aorta; edema and atrophic fat in epicardium; fibrous pleural adhesions; chronic splenitis and perisplenitis; atrophied testis; organized thrombi of iliac veins and sper-

matic plexus; dilated superficial abdominal veins; emaciation and malnutrition.

In conclusion I wish to acknowledge gratitude to Professor F. B. Mallory for the opportunity to report this case and for his helpful suggestions. The photomicrographs were made by Mr. L. S. Brown, of the Massachusetts General Hospital laboratory.

### Book Reviews.

*Surgery in War.* By ALFRED J. HULL, F.R.C.S. Major, R.A.M.C.; Surgeon, British Expeditionary Force, France; Late Lecturer on Surgical Pathology, Royal Army Medical College, Millbank; and Surgeon, Queen Alexandra Military Hospital. With a Preface by Sir ALFRED KEOGH, K.C.B., M.D. 390 pages, 26 plates and 55 text-figures. Philadelphia: P. Blakiston's Son and Company.

"Surgery in War" is the work of six or seven men who thoroughly understand the problems with which the book deals. They have succeeded in putting into one small, well-printed and readable volume exactly the things which a civil surgeon would wish to know in case he were called upon to serve in the army.

Only the strictly surgical aspect of military medicine is treated; such questions as those of sanitation and hygiene are untouched. The writers assume a knowledge of surgery on the part of the reader, and have omitted the mass of already well-known facts which tend to destroy one's interest in a treatise of this kind.

In a few minor points the writers show unfamiliarity with the latest advances. For example, they dismiss the subject of blood transfusion with the statement that the artery to vein method is the only safe method, and of course is seldom practicable under military conditions. They describe very clearly the best methods of treating septic wounds, chiefly the hypochlorous acid method of Carrel, and the hypertonic salt treatment of Wright and Gray. In their experience, the latter has been more efficacious.

Other chapters deal with the localization of foreign bodies; compound fractures; gangrene; hemorrhage; gunshot wounds of the head; injuries of the spine; wounds of the abdomen and of the chest; wounds of peripheral nerves. All are characterized by a practical, definite, common-sense attitude which makes the book a valuable guide to those who expect ever to practise war surgery, and interesting reading for those who would know something of the problems encountered therein. Many of their points are illustrated by well-chosen case-histories and by radiographs.



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## PHYSICIANS AND THE INCOME TAX.

On January 1, 1917, Massachusetts embarks on a new method of assessing taxes. Hereafter, returns are compulsory and heavy penalties await the dodger. It is safe to say that at least 90% of the physicians and surgeons in Massachusetts will come within the scope of at least one of the four new taxes, and so must file returns on or before March 1, 1917.

Blanks and instruction booklets may be obtained from the Tax Commissioner's office, Income Tax Division, State House, Boston, or from the District Income Tax offices throughout the State or from any banking institution.

Broadly speaking, and with some exceptions, those forms of investments which have been tax exempt in the past continue to be so in the future, and such intangibles as have been taxed heretofore are now to be fixed at the rate of 6% of the dividend or interest yield actually received in 1916. Annuities are taxed at the rate of 1½% and the excess of actual, realized gains

over losses in the purchase and sale of intangibles is to be taxed at 3%.

Contrary to the general impression, there is no minimum exemption in these three taxes. If the taxpayer has received any income, no matter how little, from such taxable sources he must make the return.

The fourth tax is at the rate of 1½% of the excess over \$2000 of net income from profession or business. Wife, children or dependent parents may entitle the taxpayer to an exemption up to \$3000.

Partners, executors, trustees and other fiduciaries all come within the scope of the act. Although the law is necessarily as complicated as is our complex civilization, nevertheless it is believed to be as scientific and equitable as any tax law in the United States.

For his own protection it is particularly vital that the taxpayer also file with the local city or town assessors a list of his tangible personal property. This list, however, will not contain any of the items included in the return to the State as all property paying a tax on the basis of income escapes all other State or local tax. Absolute secrecy will surround the returns filed with the State, and there will be no penalty for evasions prior to January 1, 1917, but after that date the law will be strictly enforced.

As this is but a bare outline of the law, the reader is urged to obtain the instruction booklet, and make his return as soon after January 1st as may be, and, of course, not later than March 1, 1917.

JOSEPH E. PERRY,  
Income Tax Attorney.

## MASSACHUSETTS COMMISSION ON SOCIAL INSURANCE.

THE issue of the JOURNAL for December 21, which was published as a contribution to the discussion of industrial health insurance and other pending forms of social legislation, was issued two days in advance of its date in order that it might be in the hands of members of the Massachusetts Medical Society and other readers prior to the special meeting of the Council of the Massachusetts Medical Society held at the Boston Medical Library on December 20. A report of the proceedings of this meeting will be published in the next issue of the JOURNAL.



The holding of this meeting and the fact that various special committees of physicians in different parts of the state have been appointed and are actively studying the problem, are evidence that the medical profession as a whole in this state is alive to the importance of health insurance to the community as well as to physicians and is giving it careful and deserved consideration.

Meantime the Massachusetts Commission on Social Insurance has been holding meetings and public hearings since early in October, and before it have appeared many physicians and others to discuss varying aspects of the question. Before this Commission the Doten Bill, whose original text was published in full in the issue of the JOURNAL for December 7, with editorial comment, was advocated by its author, Professor Carroll W. Doten of the Massachusetts Institute of Technology. As we have previously noted editorially, however, it seems clear that this bill, as originally drafted, is unsatisfactory in its medical relations, and a new, or modified bill will presumably be drafted by the Commission and be presented before the next session of the Massachusetts General Court.

In an editorial in its issue of Wednesday, October 4, the *Boston Transcript* commented favorably on the general principle of health insurance and on the work of the Massachusetts Commission, and presented the following statistics indicating the extent of illness among industrial workers in the United States and the proportion of such illness for which adequate medical attention is not afforded:

"The latest trustworthy estimate shows that there are 13,400,000 cases of illness each year among the 33,500,000 occupied men and women in the United States and that these cases cause a total loss of 284,750,000 working days, or 8.5 days per person. To care for that part of these cases which occurs in New York City alone, there are given each year more than 4,600,000 dispensary treatments. Even so, it is carefully estimated that little more than thirty per cent. of those needing medical care apply to dispensaries. Seeking some idea of the number who may have secured private treatment, without the aid of the dispensaries, one may turn to Boston's experience. In this city the Boston Dispensary determined after an investigation of 163 doubtful cases that only 1.12 per cent. were able to pay for private care, and proceeded to the analysis that only about one-fourth of our total population was in a like financial position. So there is not only a very large percentage of sickness but also a very

large percentage of downright inability to pay for treatment of that sickness.

Summing up the situation in New York, the United Hospital Fund, speaking for forty-six hospitals, reports that

Beyond question there are large numbers who need hospital treatment but fail to apply because they do not want to become objects of charity. At present only one in ten persons seriously ill or injured in this city now gets treated in any hospital. For lack of proper treatment thousands lose their health and efficiency and become a burden to their friends and the community."

One of the leading advocates and proponents of industrial health insurance in this country has been Dr. Rupert Blue, surgeon general of the United States Public Health Service and president of the American Medical Association. He has pointed out the early origin of measures of this sort in the more progressive European countries and its steady growth until now the only countries of Europe not possessing some such form of social legislation are Portugal, Spain, Italy, Montenegro, Albania, Greece, Bulgaria and Turkey. In Sweden, France, Iceland, Switzerland and Belgium the system adopted is one of a subsidized but voluntary health insurance. In the remaining countries health insurance is compulsory. In Italy there is compulsory maternity and railroad insurance, and in France insurance is compulsory for miners and seamen. In Germany there are at present approximately nineteen million insured wage earners.

The Massachusetts Commission in its work will have the advantage of the experience of all these countries in dealing with the problems associated with industrial insurance, and its report and recommendation may be anticipated with confidence that they will present the best feasible measure of Industrial Health Insurance thus far devised.

#### HARVARD MEDICAL SCHOOL OF CHINA.

The third annual report of the Hospital Department of the Harvard Medical School of China records in full detail the work of the past year. Originally designed to afford means of clinical instruction to the students, the Hospital has proved itself a source of rich and abundant material. The students have received practical experience in history taking and phy-



sical examinations in the out-patient department and at the bedside. They have done the routine laboratory work, followed individually the progress of selected cases, have etherized and assisted at surgical operations and have seen a large number of post-mortem examinations. The out-patient department was opened to serve as a feeder for the hospital, as well as for the practical training of the students. The out-patient department has grown rapidly, and during the latter months of the past year has provided a selected clinic, rich in important and instructive cases. The well equipped Red Cross Hospital building of 47 beds is already far too small to accommodate the cases recommended for admission. Well equipped roentgen ray, pathological and surgical departments have afforded special facilities for diagnosis and treatment. A comprehensive clinical record system contains complete records of all patients admitted. A system of obtaining and reording end results has been instituted. Postmortem examinations were performed in 25% of the fatal cases from October, 1913, when the first section was performed, to June 30, 1914, in 50 per cent. in 1914-1915, and in 76 per cent. during the past year. Routine microscopic preparations have been made, and suitable material preserved as museum specimens for teaching purposes. A training school for Chinese speaking young women has been conducted for two years with promising results.

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### HOUSEHOLD NURSING.

THERE is an important portion of every community whose need of adequate assistance in time of sickness is not satisfactorily met by the splendid organization of "trained nursing." It is a matter of expense and continuous care. The perfectly legitimate weekly charge of the graduate nurse is often as great as the weekly wage of the bread winner, and in addition he must feed and house the nurse. The district nurse may be had by the hour, but not by the week.

The family, on the other hand, are by no means fit subjects for hospital charity, and even if they were ready to accept this, beds are often not available for any but the more or less acute and short illnesses.

Some attendant must be found who is less expensive, because her training has been less prolonged and less technical, and who is more

adaptable to the simple household, because of her willingness to perform certain household duties which the responsibilities assumed by the graduate nurse make it unwise for her to undertake as a routine.

This very real and often pressing need has been fairly well met in England by the Cottage Nursing Associations, and is being supplied in this country by various similar organizations which are being formed in different cities with the help of certain funds of which Mr. Richards Bradlee is trustee. The importance of trained supervision of these attendants and of some sort of standard training of the attendants themselves is at once apparent, and in this community has been made possible through the co-operation of Mr Bradlee's organization and the Women's Municipal League of Boston.

In Jamaica Plain a Household Nursing Registry has been established, where attendants may be secured by physicians and the public. All these attendants, as a condition of their acceptance of work, accept also the supervision of a graduate nurse, who goes with them to the case, starts them on their duties, and thereafter visits them as often as the proper care of the case demands in the opinion of the attending physician, or as often as the supervising nurse's knowledge of the capabilities of this special attendant make it seem wise. This Registry has been in successful operation for over two years.

The equally great need of adequate standardized training for these attendants is being met by the Training School of the Robert Brigham Hospital, and by the recent establishment of a small Unit Training School in Lynn. Young or middle-aged women of good character and physique may obtain a two months' training under a Graduate Nurse Superintendent in the less complicated technical details of nursing and especially in the niceties of the preparation of food for the sick and the care of the sick room. The curriculum has been most carefully planned with the help of the American Hospital Association and the heads of several large training schools for nurses. At the end of two months they are placed for four months in some of the smaller but well-run hospitals, where they gain experience in the actual care of the sick. In six months, therefore, they may be employed by Household Nursing Registries under graduate nurse supervision. It is to be hoped that physicians will feel a want supplied and be glad to use these registries.



## THE HEALTH INSURANCE BILL IN PROGRESS OF IMPROVEMENT.

THE Doten bill for a state health insurance system, printed in our issue of December 7, was not regarded, by those who introduced it into the 1916 Legislature, as complete in details. This was especially recognized in relation to the medical sections. The printing of the bill should be of use to physicians in making the general scheme of health insurance clear, but physicians should not form judgment on the medical aspects of the proposed health insurance until a number of the recently drafted perfecting amendments have been considered.

There will be introduced into the 1917 Legislature a health insurance bill by the same persons who introduced the Doten bill last year, in which the medical sections have been more fully worked out, after conference with many physicians and medical organizations in this state. Further conferences are being held for this purpose. Meanwhile, the American Association for Labor Legislation has printed a greatly revised draft of the medical provisions made by its National Committee on health insurance, and these suggestions, as well as those of the Health Insurance Committee of the Massachusetts Medical Society, have been considered by the local body which has been revising the Doten bill. Continued discussion and criticism by the medical profession of the Commonwealth are desirable on this very important subject.

## MEDICAL NOTES.

CHANGES IN COST OF DRUGS.—Report from New York on December 13, records various fluctuations in the cost of certain drugs and drug compounds.

"Some of the distinctly German products which had risen to prohibitive heights owing to practical exhaustion of supplies are wavering. Permanganate of potash, which is now selling at \$2.75 and \$3 against a pre-war price of about eight cents is being watched with considerable interest. All of the potash preparations as well as a number of the fine medicinal chemicals and dye materials are in a position of status-quo so far as prices are concerned pending further developments in the European political situation.

"The principal development of interest yesterday was the announcement by domestic manufacturers of chloroform of an advance of five cents, owing to increasing demand and higher costs of production. Camphor was advanced

six cents per pound by leading domestic refiners in consequence of higher prices for crude camphor demanded by the Japanese camphor monopoly. Crushers of castor oil raised their prices one cent per pound following reports that India has declared an embargo on all future exports."

COST OF FOOT AND MOUTH EPIZOOTIC. On December 13, the United States Department of Agriculture announced the completion of its work of eradicating the epizootic of foot and mouth disease, which prevailed throughout the United States two years ago, and which necessitated the slaughter of 172,222 cattle, swine, sheep and goats valued at \$5,865,720. The cost of controlling this outbreak amounted to approximately nine million dollars, which was divided between the Federal Government and that of the several states involved.

"The disease first broke out in Niles, Mich., late in the summer of 1914, extended to twenty-two States and the District of Columbia, and was not completely controlled until last February. The true cause of the infection may never be known, but experts say it undoubtedly came from abroad.

"The expenses of eradication as paid from the Federal and States' treasuries by no means represent the full measure of the cost of this plague. The appraised valuation on a meat and dairy basis in some cases fell short of the actual value of fine pedigreed stock, but the former was all that could be allowed under the then existing law—a condition which has been remedied for the future by a provision in the latest act making appropriations for the Department of Agriculture, under which breeding and pedigree may be taken into account.

"The quarantine was gradually removed as area and States were freed from infection, and the last restrictions were rescinded June 5, 1916. For some time after removal of the quarantine veterinary inspectors were kept in the lately infected areas to supervise the restocking of farms where the disease has existed, to see whether the disease developed among animals placed on such farms, and to investigate reports of suspected new outbreaks.

"Out of the misfortune has come experience which should be of great value if the country is ever again visited by this or some other highly infectious animal plague. About 150 veterinary inspectors of the Bureau of Animal Industry, and perhaps nearly as many veterinarians in State work and private practice, took part in suppressing the outbreak and had opportunities for becoming more familiar with the nature of the disease and the best methods of dealing with it.

"Congress has seen the need of having a fund ready for such an emergency and has recently made a special appropriation of \$1,250,000 to be available for the eradication of foot-and-



mouth disease and other contagious diseases of animals in cases of emergency that may threaten the livestock industry. Some States have adopted laws and appropriated money to the same end. Perhaps the most important step needed to complete our preparation is for all the States that have not already done so to pass laws, create or improve organizations and make appropriations for dealing effectively with contagious diseases of animals."

#### EUROPEAN WAR NOTES.

**AMERICAN RED CROSS.**—The annual meeting of the American Red Cross was held in Washington, D. C., on December 13. Woodrow Wilson was re-elected president, Robert W. DeForest vice-president, Charles L. Magee secretary and William H. Taft chairman of the central committee.

John Skelton Williams presented a treasurer's report, showing the Red Cross had spent \$543,535 in the eleven months preceding Dec. 1 for war relief work, exclusive of hospital and medical supplies sent abroad. Among the relief expenditures were the following: Jewish, \$11,009; Mexican, \$44,097; Polish, \$58,938; Turkish, \$50,000, and Syrian \$8770. The balance in the treasury was reported as \$1,273,240.

Ernest P. Bicknell, director-general for civilian relief, reported that American hospital units would be withdrawn from Serbia about Jan. 1, in response to the request of the Austrian Foreign Office. He said the Red Cross had arranged to forward and distribute about \$150,000 collected for relief of Lithuanian civilians. Otto T. Bannard, of New York, member of the Red Cross commission which investigated conditions in Serbia, reported that 150,000 Serbians are destitute and near starvation. The Red Cross now has 286,461 members and 250 chapters, as compared with 22,499 members and 145 chapters a year ago."

**WAR RELIEF FUNDS.**—On Dec. 20 the totals of the principal New England relief funds for the European War reached the following amounts:

Belgian Fund .....	\$201,174.22
French Wounded Fund .....	167,740.98
Armenian Fund .....	129,688.74
French Orphanage Fund .....	72,287.36
Surgical Dressings Fund .....	59,232.17
Polish Fund .....	53,395.76
Italian Fund .....	28,558.04
Irish Fund .....	2,565.18

#### BOSTON AND NEW ENGLAND.

**WEEK'S DEATH RATE IN BOSTON.**—During the week ending Saturday noon, Dec. 16, the number of deaths reported was 201, against 255 for the same period last year, with a rate of

13.78, against 17.77 last year. There were 32 deaths under one year of age, against 43 last year, and 68 deaths over 60 years of age, against 83 last year.

The number of cases of principal reportable diseases were: diphtheria, 59; scarlet fever, 34; measles, 16; whooping cough, 6; typhoid fever, 6; tuberculosis, 41.

Included in the above were the following cases of non-residents: diphtheria, 11; scarlet fever, 7; tuberculosis, 4.

Total deaths from these diseases were: diphtheria, 3; scarlet fever, 3; whooping cough, 1; typhoid fever, 1; tuberculosis, 14.

Included in the above were the following deaths of non-residents: scarlet fever, 2.

### Correspondence.

#### THE PROBLEM OF SOCIAL HEALTH INSURANCE.

FALL RIVER, MASS., 14 December, 1916.

*Mr. Editor:*

Social health insurance is a subject that today is not only of great importance to the medical profession, but also to a large number of other people. It has for its object the taking care of persons who earn only a certain amount of wages per week or per year. The contemplated law provides for a certain amount of taxation to be assessed upon the insured, and the employer of the insured, with a contribution made by the State. The ratio is expected to be two-fifths furnished by the insured, two-fifths by the employer, and one-fifth contributed by the State. In return for the outlay upon the part of the insured, they are to receive certain benefits, namely, medical attention and medicine while sick, a certain percentage of their wages, maternity care for the wife, burial insurance, as well as appliances such as glasses, artificial limbs, etc.

The proposed law, which is a combination of socialism and despotism, is a copy of similar efforts in European countries, where it has been tried for an unsatisfactory period of time, and where it is still in an unsatisfactory state, both to the medical profession and to the people themselves. If there were no other reason than this it would be wise at least to postpone consideration of such a law until its success or failure had been established in these countries.

But this is not the only objection to such a law. There are many others. Were it possible to work this plan out to the satisfaction of all concerned, there is no question that it would be an ideal condition, but the difficulties of the problem are so great that it is inconceivable that it would ever be satisfactory to anyone, especially in the feature that calls for medical attendance. In order to carry it through, the tax upon the insured would necessarily be small. It would naturally follow that the compensation for medical aid would also be meagre. As the law would permit a large majority of the people in most of our Massachusetts cities to insure under the act, it would follow that the panel system, which would be inaugurated, would compel doctors, if they would make a living by it, to take a large number of people to care for. The amount of work they would do would be great; the compensation would be small. There would be neither inducement nor opportunity for the performance of the best medical work. Medical men, after all, are only human, and unsatisfactory conditions, such as overwork and underpay,



would be no more alluring to them than to other men. It would be inconsistent to believe that because men are practising medicine they could possibly be satisfied with conditions so entirely unfair. From the sure lack of time, as well as the lack of a stimulus to personal ambition, it would follow that the work would be carelessly done. While carelessness on the part of the medical profession is inexcusable, yet that charge is made over and over again against the panel physicians in England. It is hardly to be expected that any better results would follow the working of the act in this country. The conditions simply breed carelessness, and while that might not be a universal fault, it would certainly be a common and grave fault, which in the end would work serious harm to the people insured. It would, therefore, be unfortunate legislation for the proposed beneficiaries, who would win only a false security.

What, now, would be the advantages to the medical profession from such an act? None whatever. The English plan for carrying out the provisions of the law is through either a per capita assessment, or one where so much per call is paid the physician. The per capita assessment plan is the most dangerous, in being likely to foster all the possible abuses of such a system. The per visit plan, while being fairest to the physician, could not reasonably be expected to succeed. In order to pay a satisfactory fee, it would burden the project with an expense which would make the tax so great that the people would be unwilling to pay it. There is slight possibility that the per visit plan would ever be adopted. The expense makes it inadvisable and impracticable. Either plan would mean a great loss in revenue to the medical profession,—a loss which the profession is not able to stand. The fees paid European physicians, or even much larger fees, would not support American physicians. It would not only work injustice to the men in the profession at present, but, considering the amount of time and money that medical education costs, with the probability of greater expense in the near future, it would appear improbable to man the profession in sufficient numbers to care for the sick. The practice of medicine must necessarily, to most men, hold out an opportunity for making a living, and surely no one could conceive of this act furnishing a means of livelihood. We are, therefore, called upon to face a grave crisis, wherein the future of the profession, as well as our own livelihood, is at stake.

The danger is great, and comes from many directions. Not only do well-meaning sociologists, and self-advancing politicians see in this measure attractive possibilities, but we should have many in our own profession who, through affiliations or associations, or who, perhaps, because of their position, would be indifferent, believing that they themselves would not be touched by this law. If we are to safeguard the best interests of our profession, we cannot too soon prepare to meet this issue. United action on the part of the profession, or the greater part of the profession, will control the situation. It will secure either reasonable compensation or, better still, defeat the medical part of the social health insurance proposition. If this act promises no benefit either to the insured or to the physicians; if it threatens the life and health of the insured, and the livelihood of the physician, as well as the future of the medical profession, it is difficult to see any excuse for enacting it into law. Granting that theoretically it appears satisfactory, practically it secures nothing in a medical way that the people do not now possess. Our physicians and our hospitals are constantly taking care of a large number of sick persons who are not able to pay for the services rendered. The medical profession prefers to do it in this way. No injustice is being done to the people at large, under the present system. Every sick person can be taken care of properly.

THOMAS F. GUNNING.

## THE AMERICAN AMBULANCE HOSPITAL.

(From our Special Foreign Correspondent.)

PARIS, November 10th, 1916.

Mr. Editor:

Perhaps your readers may like a word regarding the activities of the American Ambulance Hospital at Neuilly during the past summer. The hospital itself is so favorably known, both to the profession and to the laity, that but little need be said regarding its excellence. Nevertheless, the writer cannot refrain from expressing the feeling of surprise and admiration which he had on arriving here for duty, May 1. The hospital seems hardly to be a temporary one, so well arranged and convenient are its various wards, its operating rooms, offices and other departments. Indeed, it has been facetiously said that when the architect designed high school buildings, he unwittingly succeeded in planning a modern hospital!

The work at the Ambulance during the last six months has been exceedingly active. In the early part of the summer the cases came largely from Verdun, while since the beginning of the Somme offensive almost all of the wounded have come from that region. These Somme cases arrive on an average from two days to five days after injury, thereby reaching the hospital earlier than did the patients from other portions of the front.

The very great majority of the cases admitted have been of a grave nature, as has been the case since the beginning of the war. Severe shell injuries of the long bones and joints; chest, neck and head injuries, and especially the extensive loss of facial tissues (soft parts and bone). The hospital has continued to be a centre for these so-called face and jaw wounds, and through the fortunate cooperation between the dental department and the general surgeons, exceptional results are obtained in these sadly disfiguring cases.

The surgery of the peripheral nerves occupies a large part of the attention of Dr. J. P. Hutchinson, the surgeon in charge of Service B. Dr. Hutchinson has already operated on some fifty cases of nerve injury, and something like one hundred more cases are at the Ambulance proper, or in auxiliary hospitals, awaiting a suitable time for operation. Naturally, it is too early to speak of results, but the material thus accumulated will furnish valuable statistics when studied later.

Very much might be written in detail, but it may suffice at this time to say that the hospital is looked upon with much favor by the French Government, and that it continues to endeavor to maintain the best traditions of American surgery.

CHARLES A. POWERS, M.D.

## INDUSTRIAL HEALTH INSURANCE.

Boston, December 15, 1916.

Mr. Editor:

I have just read the draft of provisions of the Committee of the Massachusetts Medical Society, as published in your Journal, December 14, 1916. It is a tentative one, inviting discussion. On the whole I agree with my idea of health insurance or, to be more polite, I agree with it. In defense of a previous article, I must, however, disagree with some of its details. Please do not consider me hypercritical on that account. I am merely performing what I consider a duty at this critical time.

In Section 1 of the proposed change, I read, "Competent physicians and surgeons shall name those upon the panel, as provided for in Section 2." My first objection to this sentence is, that the implication is too broad, that those not on the panel are incompetent. My second, that the word "panel" is an accident of the British and German Acts, and a bad accident at that. It should not be perpetuated. There is nothing in the principle of health insurance which demands it. Let us forget it and the panel system



2. In Section 2, provision is made, that every physician wishing to serve under this act, shall, before a certain date, register with the Commission. This provision is a duplication of effort, and unnecessary, as all physicians are already registered in the Commonwealth.

Again, in this section, I object to the restriction which limits a practice to 500 families or 2000 individuals. It is unconstitutional. Much as I should desire such a large practice, I object to the principle. Imagine telling a large mercantile firm that it could sell only to 2000 purchasers. This idea is another foreign inheritance, that should not be allowed to take root in the "land of the free."

3. Section 3. Appointment of physicians and surgeons as referees. Theoretically sound. Practically, too much one-man power. Caesar's wife the only candidate qualified by training and experience for the position. This section needs further revision.

4. Section 6. Hospital Treatment. This brings up the question which was one of the immediate causes of the foundation of the American College of Surgeons. And, again, we are confronted with fact, and not theory. If this proposed legislation does nothing more than to bring this matter to a head, it will have done much. As a matter of theory, we all know what a hospital should be. There is a crying need for hospital legislation which shall transform theory into fact. As a matter of fact, however, we are face to face with a condition. The civil authorities have licensed many to operate hospitals. Ours not to reason "why." Compulsory contracts would operate against some. They are, therefore, unconstitutional. We must not remedy one evil by creating another.

Yours fraternally,

JOHN J. HURLEY, M.D., F.A.C.S.

#### A PHYSICIAN'S DISCLAIMER.

Boston, 7 December, 1916.

We have recently received from Dr. S. Adolphus Knopf, Professor of Physiotherapy at the Post Graduate Medical School Hospital of New York City, a letter disclaiming personal responsibility for an advertisement which appeared on page 66 of the *Journal of the American Medical Association* for November 4, 1916, in which it was stated that Dr. Knopf had patented a certain window tent of his invention. Dr. Knopf denies categorically that he was concerned in the patenting of this tent, which, he states, was done by others without his knowledge. It seems only fair to Dr. Knopf that his disclaimer should be published in this form, that readers of the *JOURNAL* may have the opportunity to know his attitude and position in the matter.

EDITOR.

#### A CORRECTION.

Boston, December 10, 1916.

Mr. Editor:

My attention has been called to an editorial in the *JOURNAL* for November 20, which speaks of me as Dean of Tufts College Medical School. As is well known in medical circles, Dr. Charles F. Painter is Dean.

Yours very truly,

FRANK G. WHEATLEY, M.D.

#### NOTICE.

Members of the medical profession are cordially invited to participate in the presentation by the dental profession of a loving cup to Mr. Thomas Alexander Forsyth, the founder of the Forsyth Dental Infirmary for Children, at a banquet to be held Jan-

uary 20, at half after 6 o'clock, at the Hotel Somerset, Boston.

Tickets for this banquet (subscription, \$5.00) can be obtained from any member of the committee. Checks should be made payable to Dr. Charles Smith, 35 Butler Exchange, Providence, R. I.

FREDERICK A. KEYES, D.M.D., *Chairman*,  
PERCY R. HOWE, D.M.D.,  
F. S. BELYEA, D.M.D.,

*Banquet Committee on Publicity.*

#### SOCIETY NOTICE.

NEW ENGLAND PEDIATRIC SOCIETY.—The forty-fifth meeting of the New England Pediatric Society will be held in the Boston Medical Library, Friday, Dec. 29, at 8.15 p.m.

I. Report of Council and nomination of officers.  
II. The following papers will be read: 1. Case Report, Wyman Whittemore, M.D., Boston; 2. "Some Observations with Sour Milk Feeding," C. K. Johnson, M.D., Burlington, Vt.; 3. "Difficulties in the Diagnosis of Diseases of the Hip-joint," A. T. Legg, M.D., Boston; 4. "Should All Milk be Pasteurized?" Richard S. Eustis, M.D., Boston.

III. Election of officers.

Light refreshments will be served after the meeting.

A. C. EASTMAN, M.D., *President*,  
RICHARD M. SMITH, M.D., *Secretary*.

#### RECENT DEATHS.

DR. ROBERT BRINE HARRINGTON, who died recently at Grand Junction, Colorado, was born on July 30, 1879, in Somerville, Mass. He received the degree of M.D. from Tufts Medical School in 1904, served for a year as resident at the Tewksbury State Hospital, and in 1906 settled in Colorado, where he became county and city physician at Grand Junction. He is survived by his widow and two daughters.

DR. CHARLES BUTLEY, who died of cerebral hemorrhage on December 15 at Waverly, Mass., was born at Lewiston, Maine, in 1854. He received the degree of M.D. from Bowdoin and, for a time, practised his profession in Saco, Maine. Later he removed to Malden, Mass., but retired from general practice about 1900. He is survived by his widow and two children.

DR. GEORGE EMMONS SAVAGE, who died on December 14, at Leicester, Mass., was born in Rutland, Mass., on January 5, 1851. He studied dentistry with Dr. Sumner C. Whitney of Worcester, and in 1884 began the practice of his profession in that city. He was a member of the Northeastern Dental Association, of the National Dental Association and of the Massachusetts Dental Society, which he served as president in 1907. In 1908 he was chairman of the section on clinics of the National Dental Association, and was a delegate to the Fourth and Fifth International Dental Congresses, of which the latter met at Berlin in 1909. He is survived by his widow.

DR. WALTER JAMES DODD, a Fellow of the Massachusetts Medical Society, died at his home in Boston, December 18, aged 46 years. He was a native of England, became apothecary to the Massachusetts General Hospital in 1896, and photographer as well, graduated in medicine at the University of Vermont in 1908, and since then has been roentgenologist to the same hospital. For 16 years he had suffered cheerfully with x-ray burns and cancerous sequelae, and he succumbed finally to one of many operations performed for the removal of affected glands. He is survived by his widow, who was Margaret Lea of Moncton, N. S.

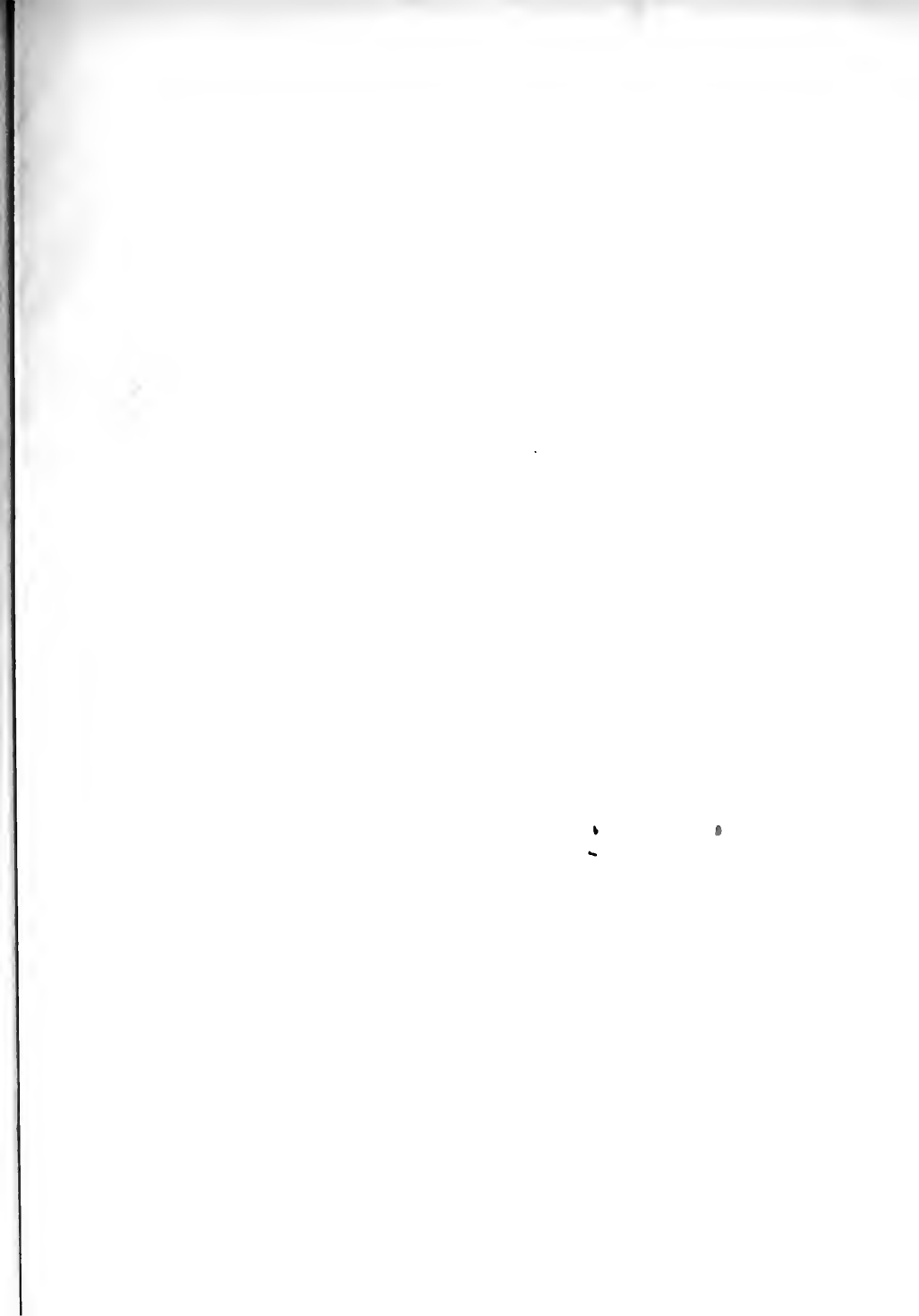


















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